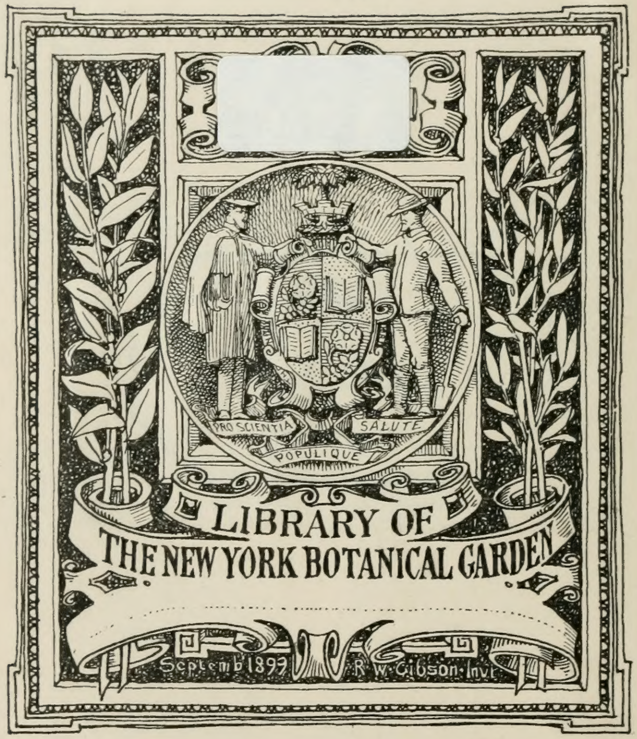

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FIRST BIENNIAL REPORT

OF THE

SECRETARY

OF THE

STATE BOARD OF AGRICULTURE

OF THE

STATE OF MICHIGAN,

FROM

Sept. 1, 1880, to Sept. 30, 1882.

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State Board of Agriculture.

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VICE PRESIDENT.

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HON. HENRY G. REYNOLDS, of Old Mission.
HON. THOMAS D. DEWEY, of Owosso.
DAVID H. JEROME, GOVERNOR OF THE STATE, } *Ex Officio.*
THEOPHILUS C. ABBOT, PRESIDENT OF THE COLLEGE. }

ROBERT G. BAIRD, SECRETARY.
EPHRAIM LONGYEAR, OF LANSING, TREASURER.

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REPORT OF THE SECRETARY

OF THE

STATE BOARD OF AGRICULTURE.

Agricultural College,
Lansing, September 30, 1882.

To David H. Jerome, Governor of the State of Michigan:

I have the honor to submit herewith to your Excellency, as required by Statute, the accompanying Biennial Report from September 1st, 1880, to September 30th, 1882.

Respectfully yours,
ROBERT G. BAIRD,
Secretary of Michigan State Board of Agriculture.

COLLEGE ACCOUNTS

(FROM SEPTEMBER 1st, 1880, TO SEPTEMBER 30th, 1882.)

SECRETARY'S ACCOUNT.

Dr.

To balance September 1st, 1880		$11 46
Department of mathematics and engineering—		
State Treasurer, Appropriation of 1879	$120 00	
" " 1881	2,020 00	2,140 00
Sale of pipes, etc		110 95
Department of botany and horticulture—		
State Treasurer	3,220 00	
Sale of microscopes, etc,	105 95	
D. M. Ferry & Co., (refunded)	4 80	3,330 75
Library—		
State Treasurer	3,000 00	
Sale of book	3 00	3,003 00
State Treasurer on account of—		
Buildings for farm department		2,750 00
Mechanical department		150 00
Farmers' institutes		600 00
Chemical department		3,000 00
Department of zoölogy		1,000 00
Repairs of buildings		1,576 00
Farm department		3,175 00
Library and museum building		25,000 00
Addition to chemical laboratory		6,000 00
Buildings for horticultural department		25 00
Experiments with ensilage, etc		1,000 00
Interest		46,343 47
Appropriation for current expenses of 1879	4,971 80	
" " " " 1881	14,498 00	19,469 80
Receipts from the institution—		
Farm department		10,525 52
Horticultural department		2,506 04
Mechanical department		2,136 06
Boarding hall, (exclusive of students)		770 76
Land sales		820 41
Library		85 41
Apiary		157 06
Museum		26 75
Current expenses, general account		397 69
Students on account of—		
Board		30,891 09
Matriculation		845 00
Incidentals		2,191 50
Room rent		1,166 00
Heating dormitories		614 25

Chemicals	$1,284 61	
Diplomas	305 00	
Special examinations	101 00	
*Error in warrant account	23 18	
Cr.		
By cash paid E. Longyear, Treasurer		$173,117 81
By balance on hand September 30th, 1882		414 95
	$173,532 76	$173,532 76

SUMMARY OF TREASURER'S REPORT.

E. Longyear in account with Agricultural College.

Dr.		
To balance September 1st, 1880	$1,163 08	
Sundry amounts received from State Treasurer, and Secretary of the State Board of Agriculture from Sept. 1st, 1880, to Sept. 30th, 1882	173,117 85	
Cr.		
By warrants paid from Sept. 1st, 1880, to Sept. 30th, 1882		$167,069 61
Balance to new account Oct. 1st, 1882		7,211 32
	$174,280 93	$174,280 93

The above is a correct summary of my report to the State Board of Agriculture.
E. LONGYEAR, *Treasurer.*

The Treasurer's balance Sept. 1st, 1880, and also the amount of warrants paid, as above, are one hundred dollars larger than appears in the Secretary's accounts, as warrant No. 4938, for one hundred dollars, drawn in August, 1880, was not presented to the Treasurer for payment until after the close of the fiscal year ending August 31st, 1880.

SUMMARY OF WARRANT ACCOUNT.

On account of special appropriations—		
Farm department	$4,329 09	
Horticultural department	2,865 56	
Mathematical and engineering department	2,202 06	
Chemical department	1,962 05	
Zoölogical department	1,051 59	
Library	2,847 33	
Institutes	591 13	
Repairs of buildings	1,573 93	
New buildings for farm department	2,750 00	
Addition to chemical laboratory	6,000 00	
Library and museum building	25,000 00	
Experiments with ensilage	309 28	
Insurance	62 50	
Mechanical department	63 88	
Building for horticultural department	25 00	
		$51,633 40
On account of current expense—		
State Board	$532 36	

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* At the close of the fiscal year I found that the amount of the warrants drawn was in excess of the vouchers paid $23.18. I could not make the correction in this report otherwise than by charging myself with the amount.

President's office—			
Postage, stationery, etc	$271 52		
Sunday services	250 00	$521 52	
Secretary's office		611 82	
Printing, (catalogues, etc.)		455 65	
Current expense, general account		3,907 57	
Repairs		3,172 47	
Professor Johnson's barn, (lumber)		201 76	
Boiler house, (lumber)		144 34	
Library, (current expense)		207 76	
Museum (current expense)		89 67	
Apiary		89 09	
Chemical laboratory		1,555 40	
Student fees refunded		330 70	
Botanical laboratory		318 39	
Steam works (boilers, piping, etc.,)		6,149 10	
College hall		316 69	
Grounds		851 68	
State Fair (exhibit of 1880)		20 50	
Student's labor (exclusive of farm and garden)		943 27	
Salaries		42,474 98	
Fuel		1,862 36	
Ice		42 42	
Advertising		20 00	
Board of employés		349 36	
Mechanical department		2,151 44	
Farm department (current expense)		10,867 05	
Horticultural department (current expense)		8,643 60	
Boarding hall		28,482 08	$115,313 03
			$166,946 43

DEPARTMENT ACCOUNTS.

FARM DEPARTMENT

In Account with Agricultural College.

DR.

To disbursements on account of current expense—	
Implements	$254 91
Fuel	24 64
Farm house	1,447 05
Labor (other than students)	1,854 04
Team	134 78
Sheep	43 14
Repairs of implements	124 35
Swine	184 95
Office	164 98
Cattle	2,496 57
Seeds	84 03
Students' labor	3,257 03
Grain	95 28
Drains	11 18
Repairs	121 39
Fertilizers	10 26
Well at farm house	140 00
Buildings	395 03
Miscellaneous	23 44
Total	$10,867 05
Appropriation for stock, etc	4,329 09
“ “ new buildings	2,750 00
“ “ experiments with ensilage	309 28
Amount to balance	314 48

CR.

By cash receipts—		
Cattle		$4,371 23
Sheep		1,168 86
Swine		818 87
Team		32 89
Grain		2,153 48
Potatoes		27 15
Implements		62 66
Farm house		963 28
Wood		539 61
Drain tiles		36 13
Students labor		183 70
Men and team labor		162 46
Lumber		5 20
Total		$10,525 52
Increase of inventory		8,041 38
	$18,566 90	$18,566 90

HORTICULTURAL DEPARTMENT

In Account with Agricultural College.

DR.

To disbursements on account of current expense—		
Greenhouse	$1,272 98	
Labor (other than students)	570 12	
Implements	225 61	
Team	1,096 39	
Fertilizers	67 38	
Office	42 94	
Grounds	573 77	
Orchard	12 45	
Vegetable garden	245 75	
Experiments	73 13	
Board of employés	501 19	
Students' labor	3,804 56	
Ice	35 25	
Botanical museum	16 36	
Miscellaneous	105 72	
Total	$8,643 60	
On account of special appropriation	2,865 56	

CR.

By cash receipts—		
Green house		$297 79
Vegetable garden		1,007 36
Team		284 43
Fertilizers		35 25
Orchard		28 45
Students' labor		563 53
Grounds		138 66
Implements		10 43
Ice		105 72
Arboretum		25 00
Experiments		9 42
Total		$2,506 04
Increase of inventory		785 10
Amount to balance		8,218 02
	$11,509 16	$11,509 16

LIBRARY

In Account with Agricultural College.

Dr.		
To disbursements on account of—		
Special appropriations	$2,847 33	
Current expense	207 76	
Amount to balance	806 09	
Cr.		
By cash received on account of—		
Sales		$85 41
Increase of inventory (purchase and donation)		3,775 87
	$3,861 28	$3,861 28

CHEMICAL DEPARTMENT

In Account with Agricultural College.

Dr.		
To disbursements on account of—		
Chemicals, etc. (current expense)	$1,555 40	
Apparatus and experiments (special appropriations)	1,962 05	
Cr.		
By cash received on account of—		
Chemicals		$1,284 61
Increase of inventory		1,554 15
Amount to balance		678 69
	$3,517 45	$3,517 45

DEPARTMENT OF ZOÖLOGY

In Account with Agricultural College.

Dr.		
To disbursements on account of—		
Current expense (museum)	$89 67	
Special appropriation	1,051 59	
*Amount to balance	1,251 94	
Cr.		
By cash received on account of—		
Current expense		$26 75
Increase of inventory (purchase and donation)		2,366 45
	$2,393 20	$2,393 20

APIARY

In Account with Agricultural College.

Dr.		
To disbursements	$89 09	
Amount to balance	95 67	
Cr.		
By cash received on account of—		
Bees and honey sold		$157 06
Increase of inventory		27 70
	$184 76	$184 76

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* The large excess in the increase of inventory in this department over the amount expended for specimens, etc., is due mainly to the fact that the new museum cases are inventoried as part of the general museum, while the cost of these cases was not charged to this department, but to the appropriation for the "Library and Museum Building," and in part, also, to the general current expense account.

MECHANICAL DEPARTMENT

In Account with Agricultural College.

Dr.

To disbursements on account of—		
Carpenter's wages, lumber, etc	$2,151 44	
Amount to balance	235 38	

Cr.

By cash on account of—		
Work and material furnished		$2,136 06
Increase of inventory		250 76
	$2,386 82	$2,386 82

BOARDING HALL

In Account with Agricultural College.

Dr.

To disbursements on account of—		
Provisions, help, fuel, utensils, etc	$28,482 08	
*Amount to balance	3,179 77	

Cr.

By cash received on account of—		
Students for board		$30,891 09
Casual boarders, sales of oil, etc		770 76
	$31,661 85	$31,661 85

SUMMARY OF INVENTORY, SEPTEMBER 30TH, 1882.

College Hall	$15,000 00
Williams Hall	45 000 00
Wells Hall	25,000 00
Library and Museum Building	25,000 00
Chemical Laboratory	18,000 00
Botanical Laboratory	6,000 00
Farm house	3,500 00
Three brick houses @ $3,000	9,000 00
Two brick houses @ $3,500	7,000 00
President's and two frame houses	20,728 00
Herdsman's house	600 00
Seven barns at professors' houses @ $300	2,100 00
Horticultural barn and shed	1,100 00
Cattle barn and shed	3,400 00
Sheep barn	2,500 00
Horse barn	3,000 00
Piggery	2,000 00
Brick work-shop	600 00
Corn-house	500 00
Blacksmith shop and tool shed	300 00
Green house	9,500 00
Grain barn	1,600 00
Tool house	1,300 00
Observatory	150 00
Boiler house and fixtures	3,870 00

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* The excess of receipts credited to board, as above, over the amount of disbursements does not show that the college has charged more for board than its actual cost. It is owing to the fact that twenty dollars advance on board was paid by each student, as required by the College, at the beginning of the fall term and just before the close of the fiscal year, while almost nothing was disbursed on account of the fall term's board till after October 1st, and consequently does not appear in this report.

Underground piping for steam		$2,000 00
Ice house		250 00
Bee house		280 00
Twelve fire extinguishers		500 00
College farm and park—676 acres @ $70		47,320 00
Farm department—		
Cattle	$14,080 00	
Sheep	2,072 00	
Swine	780 00	
Horses	750 00	
Implements, produce, etc	7,845 00	
		25,527 00
Horticultural department—		
Team, harness, and feed	$558 00	
Windmill, tank, and pumps	400 00	
Nursery stock	556 00	
Tools and miscellaneous	800 70	
Plants, fuel, etc.. at greenhouse	4,322 00	
		6,636 70
Chemical department—		
Apparatus, chemicals, etc		8,143 27
Library—		
Books, pamphlets, and furniture		16,250 20
General museum—		
Specimens, cases, etc		9,085 95
Apiary—		
Bee tools, honey, etc		287 45
Department of mathematics and engineering—		
Apparatus, telescope, tools, etc		3,079 68
Boarding hall—		
Furniture		3,549 60
Mechanical department—		
Tools, lumber etc		472 04
College hall—		
Furniture in chapel and recitation rooms		750 92
President's office—		
Furniture, stationery, etc		344 54
Secretary's office—		
Safe, furniture, stationery, etc		681 70
Botanical museum and class room—		
Specimens, furniture. microscopes, etc		6,564 50
		$338,471 55

ESTIMATES OF RECEIPTS AND EXPENDITURES FOR STATE AGRICULTURAL COLLEGE FOR THE YEARS 1883–4.

CURRENT EXPENSE.

Expenditures of Secretary for books, blanks, exchange of reports, postage, etc	$400 00	$400 00
College printing, blanks, catalogues, etc	$300 00	300 00
Expenditures in President's office for furniture, payment for Sunday services, postage, etc	$300 00	300 00
Wages of students	$3,000 00	3,000 00

SALARIES.

President	$3,000 00
Professor of Chemistry	1,800 00
" " Zoölogy	1,800 00
" " Botany	1,800 00

Professor of Mathematics	$1,800 00	
“ “ Agriculture	1,800 00	
“ “ English Language and Literature	1,800 00	
“ “ History and Political Economy	1,800 00	
“ “ Horticulture	1,800 00	
“ “ Military Science and Tactics	800 00	
Assistant in Mathematics	600 00	
“ “ Chemistry	800 00	
Lecturer in Veterinary	600 00	
Secretary	500 00	
Assistant Secretary	600 00	
Librarian	600 00	
Foreman of Horticultural Department	750 00	
“ “ Farm Department	600 00	
Steward	600 00	
Florist	743 00	
Engineer	700 00	
		$25,293 00

FUEL.

Steam heating	1,000 00	
Greenhouse, 45 tons coal	315 00	
“ “ 45 cords wood	67 00	
Secretary's office, 4 tons coal	28 00	
Chemical Laboratory, 4 tons coal	28 00	
Botanical Laboratory, 35 cords wood	70 00	
Farm Department office, 3 tons coal	21 00	
		$1,529 00

FARM DEPARTMENT.

Herdsman's salary	450 00	
Two teamsters, @ $16.00 per month	384 00	
Board of teamsters	312 00	
Repairs of implements	100 00	
Shoeing of teams, harness repairs	100 00	
Experimental feed	400 00	
Day labor and board of same	250 00	
Improvements of breeding stock	500 00	
Office expenses, herd book, etc	40 00	
Supervision of educational labor	300 00	
		$2,836 00

HORTICULTURAL DEPARTMENT.

Salary of two teamsters	384 00	
Board of same	312 00	
Grain for 4 horses, 675 bushels	236 00	
Hay, 12 tons	120 00	
Bedding	10 00	
Shoeing of teams and all blacksmithing	100 00	
Repairs of implements	50 00	
Seeds	40 00	
Stationery	20 00	
Fertilizers	200 00	
Lumber	30 00	
Extra team work on drives	200 00	
Supervision of educational labor	300 00	
		$2,002 00
Greenhouse—		
Flower pots	$25 00	
Boxes, etc	10 00	
		$35 00
Botany—		
Small repairs, screens, etc	$50 00	
Stationery	40 00	
		$90 00
Carpenter shop—		
Wages of carpenter	$600 00	
		$600 00

Incidentals—		
Contingent expenses	$1,000 00	$1,000 00
Total		$37,385 00

ESTIMATED RECEIPTS.

Interest	$22,000 00	
Receipts from sales from farm	4,500 00	
" " " " horticultural department	1,000 00	
" " students	1,500 00	$29,000 00
Amount to be appropriated for 1883		$8,385 00
1884		8,385 00
Current expense appropriations for 1883–4		$16,770 00

EXTRA.

Farmers' institutes	$600 00	$600 00
Insurance	$600 00	$600 00

LIBRARY.

Purchase of books, periodicals, and binding	$3,000 00	
Matting for library floor	50 00	
Librarian's room, furnishing	75 00	$3,125 00

MATHEMATICAL AND ENGINEERING DEPARTMENT.

Instruments and apparatus for instruction in natural philosphy	$300 00	
Solar compass	250 00	
Repairs of instruments	50 00	
Case for mathematical instruments	100 00	$700 00

CHEMICAL DEPARTMENT.

For experiments, and researches in agricultural chemistry, and for apparatus	$1,000 00	$1,000 00

DEPARTMENT OF ZOÖLOGY.

Desk with trays for class-room	$75 00	
Strong table for class-room	5 00	
One book-case for study	50 00	
Microscopic table, for slides	35 00	
Insect breeding case	15 00	
Study table	40 00	
Ten heavy tables for laboratory	50 00	
Ten chairs	15 00	
Office chair	10 00	
Two museum cases, large size	400 00	
Incidentals, alcohol, bottles, etc	250 00	
Additions to museum	1,000 00	$1,945 00

HORTICULTURAL DEPARTMENT.

1 horse	$150 00
1 set double harness	32 00
1 wagon, wide tire	65 00
2 pair horse blankets	5 00
1 horse lawn mower	80 00
3 hand lawn mowers	36 00
1 plow	14 00
1 fire fly garden plow	4 00
1 improved hand plow	2 00

1 cultivator	$6 00	
1 hay and stalk cutter	23 00	
1 post augur	3 00	
6 wheelbarrows	9 00	
1 water barrel truck	10 00	
18 hoes	12 00	
12 steel rakes	8 00	
12 wire rakes	12 00	
12 spades	9 00	
12 wood hay rakes	3 00	
12 shovels	12 00	
12 hay forks	9 00	
4 picks	8 00	
1 crow bar	2 00	
10 pairs pruning shears	15 00	
10 edging knives	10 00	
3 garden reels and lines	3 00	
6 trowels	2 00	
4 hedge shears	8 00	
10 pruning knives	10 00	
5 budding knives	5 00	
6 scuffle hoes	4 00	
6 shovel forks	6 00	
New strawberries, raspberries, potatoes, and other plants	60 00	
Grass seed for lawns	25 00	
Plants and labels for greenhouse	150 00	
Seeds and bulbs for greenhouse	30 00	
Experiments	500 00	
		$1,342 00

FARM DEPARTMENT.

Apparatus for illustration of lectures in agriculture, casts, models, drawings, maps, charts, etc	500 00	
Hand implements	200 00	
Shaft and pully for new barn	125 00	
Power cutting box	75 00	
Drainage and permanent improvements	1,000 00	
Furniture and fixtures for farm houses	200 00	
Mower	60 00	
lumber wagon	60 00	
1 roller drill	75 00	
1 corn cultivator	30 00	
2 plows	25 00	
2 harrows	60 00	
4 hay racks	40 00	
2 sets double harness	64 00	
1 caldron stove for piggery	45 00	
1 buffalo robe and 2 pair blankets	15 00	
1 pair rubber horse blankets	15 00	
Experiments in farm department, ensilage, stock, etc	800 00	
		$3,389 00

BOTANICAL DEPARTMENT.

Microscopic work table for study	$20 00	
Tables for class-room	65 00	
Chairs for class-room, 3 sets	21 00	
2 cases for class-room	75 00	
Shelves, fixtures, and stove for drying room	25 00	
2 new cases for botanical museum	400 00	
Bottles and jars	100 00	
20 cameras and 20 nose pieces for microscopes	325 00	
Apparatus for class exercises in mounting objects	100 00	
Additions for botanical museum	300 00	
Development of botanical garden	200 00	
Experiments	600 00	
		$2,231 00

REPAIRS OF BUILDINGS.

College hall—		
Fitting up agricultural class-room, raised floors, blackboards, partitions, painting, and furnishing	$500 00	
Repairs of blackboards in class-rooms A and B	50 00	
Office and instrument room, 2d floor	60 00	
Plastering two class-rooms, 2d floor	50 00	
Painting the same	15 00	
Repairs on 3d floor same as on second	175 00	
Williams Hall—		
Arcade and closet	50 00	
Repairing walls and alabastining	100 00	
Repairs of floors and stairs	50 00	
Repairs of timbers	100 00	
60 squares of corrugated iron for roof	540 00	
Wells Hall—		
Repairing roof	15 00	
16 pair spring hinges	80 00	
Chemical Laboratory—		
To finish building and to repair the roof	50 00	
Equipment of the basement for room for quantitative analysis	1,450 00	
Library and Museum Building—		
Water closet	50 00	
Sewer and drain	300 00	
Greenhouse—		
Painting, glazing, and other repairs	450 00	
Boiler house—		
To protect boiler from the weather	100 00	
Farm buildings—		
Repairs and painting	450 00	
House of Professor of Chemistry—		
Repairs and closet	25 00	
House of Professor of English Literature—		
Painting, pump, and privy	60 00	
House of Professor of Botany—		
Additions and changes	300 00	
Repairing roof	50 00	
House of Secretary—		
Repairs and changes	250 00	
House of Professor of Mathematics—		
Painting and repairing roof	100 00	
House of Professor of Agriculture—		
Repairs, etc	50 00	
Steam works—		
Repairs, changes, additions, and tools	1,000 00	
Repairing old steam pump	50 00	
		$6,520 00

NEW BUILDINGS.

House for Professor of Horticulture	$3,000 00	$3,000 00

AMOUNT OF EXTRAS.

Amount of extras		$24,452 00

MECHANICAL DEPARTMENT.

Shops for 80 students	6,000 00	
Equipment for 80 students	6,000 00	
Salary for professor for 1883	1,800 00	
" " " " 1884	1,800 00	
House for professor	3,000 00	
		$18,600 00

There is asked for 1883—		
Current expenses	$8,385 00	
One-half the extras	12,226 00	
For mechanical department	16,800 00	$37,411 00

For 1884—		
Current expenses	$8.385 00	
One-half the extras	12.226 00	
For mechanical department	1,800 00	$22,411 00

SUPPLEMENTARY STATEMENT OF THE SECRETARY.

At the close of the fiscal year all bills of the several departments rendered to the Secretary were paid. Of the balance on hand, $7,626.23, only $4,822.50 is available for the current expenses of the institution, the rest being unexpended balances of special appropriations.

The amount appropriated by the Legislature of 1881 for current expenses has all been drawn from the State Treasury. The amount on hand will be barely adequate to meet the wants of the Institution during the remainder of the calendar year.

The salaries of the officers and employés of the College are as follows:

President, $3,000; secretary, $1,500; six professors, $1,800 each; one at $1,200; one assistant in chemistry, $800; one instructor, $600; superintendent of horticultural department, $1,200; gardener, $743; farm foreman, $600; steward, $600. The two last named have their board in addition to the above.

The buildings for which appropriations were made by the Legislature of 1881 have all been completed and are now occupied. With all of them, on account of high prices, the cost has been slightly in excess of the amount appropriated for their construction. This excess had to be paid out of the current expense fund.

The Board have felt for some time that to perpetuate and keep extending the system of putting a boiler and furnace into each of the principal buildings was exceedingly undesirable. Rather than do this with the new library and museum building they undertook, with what funds they could make available for that purpose, to make a change in the arrangements for steam heating. The boilers formerly used in the two large dormitory halls were sold and removed. Four new boilers were purchased and set in a temporary house for their protection, and from this boiler house underground piping was laid to the two dormitory halls, the library and museum building, and the chemical laboratory. This change has given us a more convenient and effective system of heating, and greatly lessens the danger of loss by fire to buildings that have cost the State one hundred and twenty-eight thousand dollars for their construction, and also to the large amount of valuable property which they contain.

COLLEGE LANDS.

Through the courtesy of the Commissioner of the State Land Office we are enabled to publish the following tables giving a detailed account of the sales of college lands during the two years covered by this report; also the number of acres of these lands yet unsold, and the counties in which they are located. Persons desiring information regarding their price, or other conditions of sale, should address their communications to the Commissioner of the State Land Office, Lansing, Mich.

AGRICULTURAL COLLEGE LAND.

TABLE No. 1.—Showing by Counties the Amount of Agricultural College Land Sold at Original Sale during the Year ending September 30, 1881.

COUNTIES.	Acres.	Price.	Amount.	Amount Paid.	Amount Due.
Alcona	485.37	$5 00	$2.426 85	$2,426 85	------------
Alpena	120.00	3 00	360 00	90 00	$270 00
Antrim	600.00	3 00	1,800 00	450 00	1,350 00
"	358.35	5 00	1,791 75	1,641 75	150 00
Benzie	80.00	3 00	240 00	60 00	180 00
"	80.00	5 00	400 00	250 00	150 00
Charlevoix	320.00	3 00	960 00	240 00	720 00
Cheboygan	275.70	3 00	827 10	330 00	497 10
"	80.00	5 00	400 00	400 00	------------
Kalkaska	199.60	3 00	598 80	150 00	448 80
"	200.00	5 00	1,000 00	550 00	450 00
Manistee	560.00	3 00	1,680 00	420 00	1,260 00
"	160.00	5 00	800 00	500 00	300 00
Missaukee	360.00	3 00	1,080 00	270 00	810 00
"	40.00	5 00	200 00	50 00	150 00
Montmorency	80 00	3 00	240 00	60 00	180 00
"	600.00	5 00	3,000 00	1,330 00	1,670 00
Oscoda	80.00	5 00	400 00	400 00	------------
Otsego	203.50	3 00	610 50	340 50	270 00
"	326.45	5 00	1,632 25	732 25	900 00
Wexford	400.00	3 00	1,200 00	300 00	900 00
"	560.00	5 00	2,800 00	1,640 00	1,160 00
Total	6,168.97	--------	$24,447 25	$12,631 35	$11,815 90

AGRICULTURAL COLLEGE LAND.

TABLE No. 2.—Showing by Counties the Amount of Forfeited Agricultural College Land Sold during the Year ending September 30, 1881.

COUNTIES.	Acres.	Price.	Amount.	Amount Paid.	Amount Due.
Alcona	80 00	$5 00	$400 00	$400 00	------------
Manistee	40.00	3 00	120 00	30 00	$90 00
"	80.00	5 00	400 00	400 00	------------
Missaukee	40.00	5 00	200 00	50 00	150 00
Wexford	80 00	3 00	240 00	60 00	180 00
"	40.00	5 00	200 00	50 00	150 00
Total	360.00	--------	$1,560 00	$990 00	$570 00

AGRICULTURAL COLLEGE LANDS.

TABLE Showing by Counties the Amount of Agricultural College Land Sold at Original Sale during the Year ending September 30, 1882.

COUNTIES.	Acres.	Price.	Amount.	Amount Paid.	Amount Due.
Alcona	2,249.20	$5 00	$11.246 00	$11,246 00	....
Antrim	1,040.00	5 00	5,200 00	4,375 00	$825 00
Benzie	1,200.00	5 00	6,000 00	1,500 00	4,500 00
Cheboygan	80.00	5 00	400 00	400 00	....
Grand Traverse	160.00	5 00	800 00	800 00	....
Iosco	200.00	5 00	1,000 00	1,000 00	....
Kalkaska	557.50	5 00	2,787 50	2,787 50	....
Manistee	560.00	5 00	2,800 00	850 00	1,950 00
Missaukee	240.00	5 00	1,200 00	300 00	900 00
Montmorency	812.20	5 00	4,061 00	1,661 15	2,399 85
Oscoda	760.72	5 00	3,803 60	2,753 60	1,050 00
Otsego	206.37	5 00	1,031 85	531 85	500 00
Presque Isle	400.00	5 00	2,000 00	560 00	1,440 00
Wexford	1,760.00	5 00	8,800 00	7,650 00	1,150 00
Totals	10,225.99	....	$51,129 95	$36,415 10	$14,714 85

AGRICULTURAL COLLEGE LANDS.

TABLE Showing, by Counties, the Amount of Forfeited Agricultural College Land Sold during the Year ending September 30, 1882.

COUNTIES.	Acres.	Price.	Amount.	Amount Paid.	Amount Due.
Alcona	200.00	$5 00	$1,000 00	$1,000 00	....
Antrim	357.95	5 00	1,789 75	1,789 75	....
Benzie	160.00	5 00	800 00	200 00	$600 00
Grand Traverse	120.00	5 00	600 00	318 87	281 13
Iosco	40.00	5 00	200 00	200 00	....
Kalkaska	80.00	6 87½	550 00	137 50	412 50
Missaukee	39.45	5 00	197 25	197 25	....
Presque Isle	159.61	5 00	798 05	199 52	598 53
Wexford	480.00	5 00	2,400 00	1,050 00	1,350 00
Totals	1,637.01	....	$8,335 05	$5,092 89	$3,242 16

AGRICULTURAL COLLEGE LAND.

TABLE Showing by Counties, the Total Number of Acres of Agricultural College Lands vacant, that have never been Sold; also the Number of Acres which have become vacant by Forfeiture to the State for the Year ending September 30, 1882.

COUNTIES.	Vacant Acres.	Forfeited Land Vacant.	Total.
Alcona	23,055.86	280.00	23,335.86
Alpena	280.00	560.00	840.00
Antrim	4,440.93	360.00	4,800.93
Benzie	4,240.00	360.00	4,600.00
Charlevoix	3,164.98	360.11	3,525.09
Cheboygan	2,837.66	2,811.10	5,648.76
Grand Traverse	200.00	240.00	440.00
Iosco	26,874.97		26,874.97
Kalkaska	1,120.68	40.00	1,160.68
Manistee	5,920.00	1,880.00	7,800.00
Missaukee	1,200.69	278.95	1,479.64
Montmorency	8,065.80		8,065.80
Oscoda	16,184.55	120.00	16,304.55
Otsego	3,820.62	292.97	4,113.59
Presque Isle	560.00	120.00	680.00
Wexford	22,920.00	2,880.00	25,800.00
Totals	124,886.74	10,583.13	135,469.87

DEPARTMENT REPORTS.

PRESIDENT'S REPORT.

MICHIGAN STATE AGRICULTURAL COLLEGE,
Sept. 30, 1882.

To the State Board of Agriculture:

I respectfully submit the following report of the condition of the State Agricultural College, and the reports of the officers in charge of the several departments, giving altogether an account of what has been done from Sept. 1, 1880, to Sept. 30, 1882, being two years known as the year 1881–2 and the year 1882–3. The report will be mostly occupied with an account of things up to August 30 only, as on Sept. 30 the first term of a new year is but begun.

REPORTS.

Up to and including 1880, the college has published an annual report. The reports for the years 1857 to 1860 are to be found in the reports of the Superintendent of Public Instruction. In 1861 there was no report separate from that of 1862. The reports for 1862 and 1863 are to be found in the Joint Documents of the State for those years. From 1864 to 1880 inclusive, the college published a report annually in the form of a separate bound volume. The college has published a catalogue annually, being, sometimes, up to 1861 but lists of names. A catalogue in the form of a pamphlet for distribution was published each year from 1861 to 1879 inclusive. All the classes after that time having entered college in September, catalogues have been issued for 1880–81, 1881–2. The last named is the twenty-fifth annual catalogue. Twenty-five full college years should have closed in the autumn of 1881, but for a change in the beginning of the college school year made subsequently to the loss of the first dormitory by fire in Dec., 1876. Triennial catalogues of the officers and alumni have been published in 1876, 1879, and the last in season to be ready for the seventh triennial reunion of the alumni, in 1882. Massachusetts, Illinois, and several other states embody the catalogues of officers and students in the reports. This college has but rarely duplicated in the reports the matter of the catalogue.

BIENNIAL REPORTS.

The last session of the Legislature of the State, in an act No. 206, 1881, to provide for the uniform regulation of certain state institutions, provides for the publication of a biennial report only. A manuscript report also is to be made annually to the Superintendent of Public Instruction. The same enactment changed the date of the close of our fiscal year from August 31 to September 30.

A query having arisen as to whether the annual reports were to be discontinued under the new law, the matter was referred by the Board of Agriculture to the Attorney General. In his reply of June 7th he states that the reports required of the board and faculty are (not mentioning the manuscript report to the Superintendent of Public Instruction) 1st, a biennial report as required in act 206, laws 1881; and 2d, a report to be made to the president of the college (act No. 221, 1875) by each of superintendents, curators, and professors, annually.

UNITED STATES LAW REGARDING REPORTS.

I hardly see how the present law regarding our reports fulfills the duty of the State to the United States. The grant of lands out of which the college endowment comes was made by Congress in an act approved July 2d, 1862, from the fifth section of which the following is an extract:

"*And be it further enacted*, that the grant of lands and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the conditions hereinbefore contained, the previous assent of the several states shall be signified by legislative act:

"Fourth, An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their cost and results, and such other matters, including state industrial and economical statistics, as may be supposed useful, one copy of which shall be transmitted by mail free to all the colleges which may be endowed under provisions of this act, and also one copy to the Secretary of the Interior."

How can this promise of the State to the general government be fulfilled unless an annual report is published?

LEGISLATON.

The message of the retiring Governor, Mr. Croswell, and the inaugural message of Governor Jerome, recommended a generous policy towards the College, and it was carried out.

The appropriations made were:—

For current expenses for 1881	$7,249 00
For current expenses for 1882	7,249 00
For library and museum building, 1881	25,000 00
For enlargement of chemical laboratory, 1881	6,000 00
For farm buildings, 1881	2,750 00
For horticultural department building, 1881	25 00

For special purposes as follows, one-half to be drawn in 1881 and one-half in 1882:—

Farmers' institutes	$600 00
Library	3,000 00
Department of mathematics and civil engineering (apparatus for instruction, $925, steam works, drainage, etc., $1,095)	2,020 00
Zoölogy	1,000 00
Chemistry	3,000 00
Botany and horticulture	3,175 00
Mechanical department	300 00
Repairs	1,576 00

A further sum was appropriated for conducting experiments with ensilage, amber cane, and other grains, by the farm department, of $1,000. The aggregate of the appropriations for 1881 is $50,969.50, and for 1882, $16,194.50.

THE BOARD.

The period of six years' service of Hon. J. Webster Childs and Hon. Milton J. Gard having expired, Mr. Childs was reappointed upon the Board, and Mr. Thomas D. Dewey, of Owosso, succeeded Mr. Gard and was made chairman of the committee on buildings. The college will remember with gratitude the faithful services of Mr. Gard, who was always present at Board meetings, and, as a member of the committee on farm, was frequently here a day in advance to examine into its condition. The members of the Board of Agriculture are: H. G. Wells, of Kalamazoo (since 1861, term expires January, 1882); J. Webster Childs, of Ypsilanti (since 1869; term expires 1886); Geo. W. Phillips, of Romeo (since 1871; term expires 1882); Franklin Wells, of Constantine, chairman of the finance committee, through whose hands every account against the college passes for approval (since 1873; term expires 1884); Henry G. Reynolds, of Old Mission, a graduate of the college, and whose previous service as an officer in the college gardens and grounds adds to his fitness for the chairmanship of the horticultural department, which he holds (since 1879; term expires 1884); Thomas D. Dewey, of Owosso, (1881–1886); and the governor of the State and the president of the college, ex-officio.

It is customary for the board to reorganize on the appointment of new members upon it. Hon. H. G. Wells was elected president, and the committees constituted as follows: On finance, Messrs. F. Wells and Phillips; farm, Phillips and Childs; horticultural department, Reynolds and H. G. Wells; buildings and college property, Dewey and F. Wells; employés, Childs and Reynolds; farmers' institutes, Childs and Phillips. Rev. R. G. Baird is the secretary, and Ephraim Longyear the treasurer of the board.

The board by a standing invitation receive the faculty the first evening of their sessions and hear from each member any representations he desires to make regarding his department or the general concerns of the college.

The new law makes the relations of the college to the Superintendent of Public Instruction closer than heretofore, and requires his presence at Board meetings at least once a year.

ENDOWMENT AND SUPPORT.

Salt Spring Lands.

On the establishment of the College Act, No. 130, approved Feb. 12, 1855, the Legislature appropriated for the purpose of purchasing a farm, erecting buildings, etc., twenty-two sections of salt spring lands, and at once paid over to the college the minimum price of the lands, $56,320.

Agricultural College Trust Fund.

The laws relating to an appropriation of lands by Congress to the State will be given in this volume. The sale of these lands are the source of a permanent fund for the support of the college. The State pays 7 % per annum on this fund to the college, in quarterly payments. It also pays over the interest at 7 % received on part paid lands, from the purchasers.

The number of acres sold in 1881, Sept. 30, was 6,168.97 acres for $24,447.25. Sold in 1882, Sept. 30, 10,225.99 acres for $51,129.95. The number of acres vacant to be sold, 135,469.87 acres. The total number of acres received from the United States, owing to the rules of the land office at Washington regarding fractional sections, was (not 240,000 acres, but) 235,673.37 acres.

The trust fund in the treasury of the State was, Sept. 30, 1880	$153,137 70
Net additions to Sept. 30, 1881	20,281 18
	$173,418 88
Net additions to Sept. 30, 1882	51,449 27
Amount of fund Sept. 30, 1882	$224,868 15

Swamp Lands.

Swamp lands were given to the college by the act of reorganization, 1861. These lands are so nearly sold that they cannot be relied on for any income.

College Receipts.

Tuition is free; board is at cost, and most of the other receipts from students are expended in definite ways for their benefit. The farm receipts go into the general College Fund and reduce the amount of appropriations asked for. In the accounts of the College, and in the estimates all these items are published; but it is hardly worth while to set down receipts from students as a source of regular income.

Legislative Appropriations.

The Legislature has been liberal in its appropriations to the Institution.

The following table presents the receipts of the Institution from several sources for the twenty-five years since the opening of the College to the present time.

Moneys received from the several sources specified:

YEARS.	Appropriations.	Sale of Lands.	Interest.
1855		*$56,320 00	
1857	$40,000 00		
1859	37,500 00		
1861	16,500 00	152 25	
1862		218 97	
1863	18,000 00	407 80	
1864		720 09	
1865	30,000 00	1,156 61	
1866		1,094 27	
1867	40,000 00	7,608 38	
1868		592 49	
1869	70,000 00	18,559 00	
1870		1,320 02	2,779 87
1871	50,000 00	4,135 72	3,816 44
1872		217 05	7,134 03
1873	66,000 00	10 13	11,038 48
1874		80 13	14,076 00
1875	29,787 00	214 53	14,413 72
1876		1,773 09	16,880 17
1877	48,673 60	979 06	15,172 86
1878		826 60	13,570 61
1879	33,080 12	712 72	16,602 02
1880	12,040 12	797 55	17,799 15
1881	50,969 50	461 95	20,451 85
1882	16,194 50	358 46	25,891 62
Total	$558,744 84	$98,716 87	$179,626 82

*Salt spring lands.

The last item of interest is for five quarterly receipts, or fifteen months.

The $56,320 from salt spring lands is included in the total of receipts from sale of lands. Exclusive of this the receipts from the sale of swamp lands have amounted to $42,396.87.

That the appropriations of the State are liberal to other institutions as well as to the Agricultural College can be seen from the following amounts of appropriations for 1882, taken from the Auditor General's statement, Oct. 5, 1882:

To the University	$120,500 00
Normal School	19,500 00
Agricultural College	16,194 50
State Public School	41,650 00
School for the Blind	29,800 00
Deaf and Dumb	41,600 00

The property of the College, exclusive of lands for sale, is, Sept. 30, 1882, $338,471.55, an increase of $64,091.49 over the preceding inventory, Sept. 30, 1880. The amount of money appropriations to the College, less the inventory, divided by 26, the number of college years, up to Dec. 30, 1882, gives less than $8,500 a year. If from the total receipts of the College from salt spring lands, swamp lands, legislative appropriations, and interest on the land grant fund, we deduct the inventory, and then divide by 26 we get less than $19,200 for the average current expenses of the College.

Faculty and other Officers.

Owing to the continuous presence of four classes at the College since Sept., 1880, some changes and additions were made in the departments.

History, Political Economy, and Political Science were set off as a separate field of instruction, and committed to the charge of George W. Harrower, A. B., a graduate of Michigan University, Literary Department, 1878. Mr. Louis G. Carpenter, a graduate of this College of the class of 1879, has acted as Assistant in Mathematics. A. J. Murray, Veterinary Surgeon, has given a six weeks course in Veterinary Science and practice to each of the senior classes of 1881 and 1882. Mr. Will S. Holdsworth, a graduate of the College, 1878, gave instruction for one term in 1881, in instrumental and free hand drawing.

The Horticultural Department was under the superintendency of Dr. Beal, Professor of Botany and Horticulture, in all the details of its labor and care of its property, as well as in its instruction. In the spring of 1881 a change was made, so that the instruction, the care of the arboretum, and the botanic gardens remained in charge of Dr. Beal, while the out-of-door-work was put in charge of a Superintendent of the Horticultural Department, Mr. Louis Knapper, a gentleman thoroughly educated for his work in German schools. The greenhouse was not put in charge of Mr. Knapper, but has remained, in its management, nearly independent of the other branches of the Horticultural Department, and has made its reports to, and depended for its assignments of labor directly on, the President of the College. Mr. James Cassidy holds the place he has held for the last eight years.

It gives me deep pain to have to record the loss by death, March 22, 1881, of Henry E. Owen, of Adrian, the Assistant in Botany. Mr. Owen's high moral qualities and other excellencies of character, his enthusiasm in the study of botany, horticulture, and floriculture, and his exquisite taste made him a great favorite at the College, and we predicted for him a bright career of usefulness. He was a graduate of the College of the class of 1878. His place has been supplied by his classmate, Mr. James Troop.

From March 21 to August 20, 1881, Mr. Charles W. Lee was vegetable gardener under the general management of the superintendent of the department. He was a very skillful gardener. Mr. E. C. Fox, at the close of the college year, August, 1881, resigned his place as steward of the boarding hall, and Mr. Conway B. Mallory was appointed to the position. The office of Assistant Foreman on the farm was abolished, with the approval of the Professor of Agriculture, at the close of the autumn term, 1880, causing us the loss of the services of Mr. Ransom H. McDowell, a graduate of the class of 1874, who had labored faithfully in the place since 1878.

Commencement, August 16, 1881.

The exercises of this occasion were: A baccalaureate sermon by President Abbot on Sunday afternoon; Senior Class Day exercises the evening preceding Commencement, and the President's reception the evening of Commencement Day. The degree of Bachelor of Science was conferred upon the following:

Herbert Bamber, Highland, Oakland county; Joseph I. Bicknell, Jr., Riverdale, New York City; William H. Burgess, Deckerville, Sanilac county; Charles E. Bush, Lansing, Ingham county; Carroll W. Clark, Orion, Oakland county; Carlton R. Dart, Lansing, Ingham county; William S. Delano, Oxford, Oakland county; Cadalzo A. Dockstader, Centerville, St. Joseph county; George W. Grover, Hanover, Jackson county; Howard M. Holmes, Otsego Lake, Otsego county; William R. Hubbert, Detroit, Wayne county; Arthur Jones, Lansing, Ingham county; Josiah L. H. Knight, Lee's Park, Nebraska; Walter I. Lillie, Lamont, Ottawa county; Daniel S. Lincoln, Greenville, Montcalm county; Charles W. McCurdy, Dansville, New York; Edward C. McKee, Laingsburg, Shiawassee county; Charles McKenny, Dimondale, Eaton county; Mrs. Mary J. C. Merrill, Lansing, Ingham county; Byron S. Palmer, Orangeville, Branch county; Willis W. Palmer, Orangeville, Branch county; Charles D. Phelps, Palo, Ionia county; Harvey A. Price, Locke, Ingham county; Harvey L. Rosenberry, Lansing, Ingham county; Alva Sherwood, New Troy, Berrien county; William G. Simonson, Birmingham, Oakland county; Ambrose E. Smith, New Troy, Berrien county; Amos W. Troop, Dimondale, Eaton county; Arthur B. Turner, Sturgis, St. Joseph county; Sherman Upton, Big Rapids, Mecosta county; Albert H. Voigt, Ludington, Mason county; Clarence R. White, Hillsdale, Hillsdale county; Jason Woodman, Paw Paw, Van Buren county.

The number of graduates was 33, bringing the total number up to 244.

Speil's orchestra, Detroit, furnished the music.

Class motto: "Excellence through thought and labor."

Commencement, 1882.

The Annual Commencement Exercises took place August 15th, 1882. President Abbot preached the baccalaureate sermon on Sunday afternoon, August 13th, on the duties that graduates of the College owe to the State.

Class Day exercises of the graduating class took place on Monday evening.

The exercises of the graduating class were on Tuesday afternoon. Eight of the seniors were selected by lot to represent the class, and Spiel's orchestra, of Detroit, furnished the music.

The class motto was: "To be rather than to seem."

The degree of Bachelor of Science was conferred upon the following persons, twenty-seven gentlemen and one lady: Lincoln Avery, Blaine; Liberty H. Bailey, Jr., South Haven; Erwin N. Ball, Hamburg; J. Wesley Beaumont, Hart; Alford J. Chappell, Charlotte; Wm. H. Coffron, North Branch; Joseph E. Coulter, Ontonagon; Charles W. Crossman, Benton Harbor; Fred E. Delano, Oxford; John F. Evert, Moorepark; Warren H. Goss, Bangor; Will E. Hale, Eaton Rapids; Lewis B. Hall, Belding; Jacob M. Hollingsworth, Ridge Farm, Ill.; Lucius W. Hoyt, Grand Rapids; Jefferson H. Irish, Pontiac; Wm. T. Langley, Centerville; James L. McClear, Unadilla; Eugene D. Millis, Matherton; Theodore F. Millspaugh, Walden, New York; Edwin A. Murphy, Lyons; Charles B. Plummer, South Haven; John R. Shelton, Owosso; James M. Smith, Hubbardston; Fred C. Snyder, Greenville; Wm. L. Snyder, Greenville; Gaylord W. Thompson, Kensington; Alice Weed, Lansing.

The degree of Master of Science was then conferred on: Frank S. Kedzie, class of 1877, assistant in chemistry, for proficiency in chemistry; William C. Latta, class of 1877, instructor in agriculture, Purdue University, Indiana, for proficiency in agriculture; Charles C. Georgeson, class of 1878, professor of Agriculture and Horticulture in the Texas Agricultural College, for proficiency in agriculture; James Troop, class of 1878, assistant in horticultural experiments, for proficiency in physiological botany.

The number of graduates was twenty-eight, bringing the total number up to 272.

After the conferring of degrees, the graduating class was addressed by his Excellency, Governor Jerome, and by Hon. V. B. Cochran, Superintendent of Public Instruction.

The reception given by the president in the evening closed the regular commencement programme.

The exercises throughout were rendered more than usually interesting by the presence in large numbers of the

ALUMNI.

The seventh reunion of the Alumni occurred the day after commencement, Mr. James Satterlee (class of 1869) being president, and Prof. R. C. Carpenter (1873) secretary.

The programme of these exercises follows:

GENERAL EXERCISES.

Business meeting, 8–10 A. M., Chemical Lecture Room.
Literary Exercises, 10:30 A. M., Chapel.
Review of Grounds, etc., with Faculty, 2 P. M.
Class Meetings, 5–7 P. M.: '61 to '70 inclusive, Prof. Cook's study; '71 and '77, Chemical Laboratory; '72 and '73, Prof. Carpenter's study; '74 and '75, College Hall, 3rd story; '76 and '78, Botanical Laboratory; '79 and '80, College Hall, 2d story; '81, College Chapel.
Banquet for Alumni, 8 P. M., Dining Hall.

PUBLIC EXERCISES, 10:30 A. M.

Music, March from "Nisida," . . . . *Genee.*
Prayer.
Music, Andante from VI Symphony, ... *Haydn.*
History, ... Henry A. Haigh, '74.
Music, Cornet Solo, ... *Chickering.*
Richard H. Gulley, '78.

Poem,	Frank Hodgman, '62
Music, Carnival Quadrille,	*Strauss*
Oration,	John P. Finley, '73
Music—Song, "Twenty Years Ago,"	Frank Hodgman, '62

The "History" by Henry A. Haigh, Esq., '74, was in part a touching tribute to the memory of the graduates who have died since the alumni gathering of 1879—George W. Eaton, Dalston P. Strange, John W. Porter, William K. Kedzie, Robert F. Kedzie, George W. Long, William A. Henderson, Lyman Mason, Charles L. Jackson, and Henry E. Owen—graduates endeared to those who knew them by great excellencies of character, whom the College could ill afford to spare.

NECROLOGY.

The necrology of the graduates has not been written, and the idea of doing so occurs to me too late to do much more than to give a brief notice of each, and to insert, as I have the permission of the secretary of the Alumni Association to do, the portion of Mr. Haigh's address on this subject:

The class of 1861, the first graduating class of the college, hastened, all but one, to join the army. They had their likenesses taken in a group, and the painting now adorns the reading room of the College. Of this class was Henry D. Benham. He came from East Winsor, Eaton county, on the day, I believe, of the opening of the College, May 13, 1857, and entered into the second class as they were then divided. The first class should have graduated in 1860, but was dispersed by a shortening of and radical change in the course of study, a change which lasted but one year. Mr. Benham was graduated at the age of 21 in 1861. He was 1st lieutenant of 1st Michigan 102 U. S. Colored Infantry; died of disease at Beaufort, S. C., July 3, 1864. He was a good scholar and of most exemplary character.

Gilbert A. Dickey, son of the Hon. Chas. Dickey, of Marshall, came to the College in the winter of 1857. He was considered by the officers the model student. He was never absent, never late, scarcely ever less than perfect in lessons. His work was done as regularly and well as his studies. He seemed to be conscientiousness itself. He was graduated at the age of eighteen in 1861, and at once entered the army. After the battle of Gettysburg, July 1, 1863, he was found, killed at the head of all the slain, before a place that had been stormed. He was second lieutenant of the 24th Michigan Infantry, and well merited the praise given him in the volume, "Michigan in the War."

Mr. William A. Hardy came to the College from his father's farm about two miles north of the College in Meridian, in the spring of 1861, was graduated in 1864, and made Master of Science in 1867. Consumption carried him away, after months of deceitful hope, in 1869. Mr. Hardy was much beloved by officers and students for his unobtrusive, kindly ways, and substantial worth.

Mr. Daniel K. Gunn, of Ionia, entered the preparatory class in 1866, and was graduated in 1870 at the age of 29. He then became a fruit culturist in South Haven. Mr. Gunn came to the College with but one arm, having sacrificed the other on one of our country's battle-fields. He suffered from his wounds throughout his college course, and sank into his grave in 1871. He left an excellent record behind him as to moral worth, and as fair a one for scholarship as could be expected of one out of health.

The other graduates who have died are all so kindly mentioned by Mr. Haigh, the historian of the Alumni, that I transfer that portion of his history to my report:

"The historian of nine years ago told you of four deaths that had occurred; the historian of six years ago made record of no more; nor did the historian of the last reunion have other names to add. Those four were all: Dickey and Benham, who died in the army, and Hardy and Gunn, who died early in the days of this our brotherhood. The wing of the death-angel left thus but few pages of our earlier histories darkened with the black margin. For eight years prior to the last meeting there came no death message to our numbers. To-day I must open a sadder chapter. Our death roll numbers fourteen now. Ten deaths have darkened our portals since we met, and the shadows from the cypresses fall on fair names endeared to us by fondest association.

"The historian feels justly privileged, at the expense of possible tedium, to dwell upon these young lives—so early ended—with such detail consideration as from the meagre data furnished him he is enabled to.

"Scarcely had we reached our homes after the last reunion, when the first of this long roll of those departed was called to meet a tragic death at the hands of pitiless murderers on the distant, sun-parched plains of Colorado.

"GEORGE W. EATON, of the class of 1869, was killed by the Ute Indians at White River Agency, Colorado, on somewhere about the 29th of September, 1879.

"Eaton was born at Ridgway, Lenawee county, in this State, June 16, 1845. He entered this college with the class of 1869, and he is remembered kindly by his classmates as a hard-working and faithful student—not over brilliant it may be, but one of those fellows who may be depended on,—a quality better than brilliancy. On the 28th of April, 1870, a few months after graduating, he started for Colorado as a member of the famous 'Union Colony,' which founded the now prosperous and beautiful town of Greeley in that State. He remained there engaged for the most part in farming until September, 1879, when he was engaged by Indian Agent Meeker to go to the White River Agency to assist him in teaching the Indians how to cultivate the soil. The Indians rebelled against this idea, and without further well-known cause arose in force and massacred the members of the agency with, it is believed, but one exception. The bodies of those murdered were stripped but not treated to further indignities. Eaton's body was found by the soldiers of General Merritt's command near the agency on the 11th of October. It was denuded of all clothing and held in its hand a package of dispatches. A bullet had pierced the left breast. This massacre is regarded as one of the most cruel and uncalled for of any in the history of our treatment of the Indians. No punishment has ever been meted out to the Indians for this crime. Poor Eaton's body lies buried near the spot where it was found.

"On the 3d of February, following, Dalston P. Strange, of the class of 1871, died at the home of his childhood, in Oneida, in this State. He was born Oct. 1, 1850, and entered this institution in 1866. Those who remember him in his College days can but cherish pleasantest memories of his kindness and gentility, his good will and his warm heart. Gentle as a woman, he was faithful to a lofty view of life. He graduated with the class of 1871, and in the same year, when only twenty-one years of age, was appointed Professor of Agriculture in the University of Minnesota. He remained two years in this position, after which he went to the Boston Institute of Technology to pursue his studies in his chosen specialty—chemical physics. He later developed a proficiency in this line which presaged well of future usefulness. Failing health compelled him to relinquish his studies in the following year and return to his home; but his health afterward so far recovered as to enable him to pursue his studies at Ann Arbor during the winter of 1876–7, and to spend the following summer at Grand Rapids assisting his old friend and classmate, Peter Felker, in producing 'The Grocer's Manual,' a book of no inconsiderable importance. The winter of 1877–8 he again spent at Boston, pursuing his special studies, but was compelled to relinquish them in the early spring by disease, which developed into pulmonary consumption. Travel in the distant west failed to restore him to health, and he returned to his home in August, 1879, to spend his last days amid scenes endeared to him by early and long association, and surrounded by those whom he loved dearest and best. He died February 4, 1880. Strange was a good, true man. We liked him well. Gentle, kind, pure as his high ideal of life, faithful, resolute, and with a noble purpose in his soul. We liked him well.

"Less than a week after the death of Strange, John W. Porter, a member of the same class, a man of somewhat different stamp, yet in whose life there was much that was good, much that was of the best, died of the same disease at Greeley, in the State of Colorado. The details of his early life I have not been able to gather; replies to inquiries sent to various sources not having yet been received. He was earnest and steadfast in his student life, and honest to a high and liberal endeavor. For some years after graduation he was engaged in the sale of a publication known as the 'Illustrated Atlas of Michigan,' and afterwards was similarly interested in Wisconsin in a like publication concerning that State. These enterprises it is understood were successful in a business way, but a harsh stroke of fate prevented their continuance. The dread disease, consumption, compelled its victim to seek a more congenial clime. In the spring of 1878 he went to Greeley, Colorado, where he resided until his death. The details of his life there also the writer has not yet been able to ascertain. A clipping from the Colorado Sun of Feb. 14, 1880, four days after Porter's death, serves to give an idea of the esteem in which he seems to have been held in that community. The clipping is hereto attached, portions of which it seems fitting to read as a part of this history:

"'Died in Greeley, Feb. 9th, John W. Porter.

"'Nearly two years ago Mr. Porter came to our town from Michigan to seek a season of rest from arduous work, and try the effects of the climate of Colorado upon his health, which for a year had been delicate.

"'He at once made a deep impression upon those who formed his acquaintance, not so much by his gentle courtesy, winning manners, scholarly bearing, and wonderful personal magnetism, as by a certain simplicity and directness of mind that must needs convince one that he loved and pursued Truth with his whole might, and was loyal to her with all the earnestness of his generous soul.

"'It is a sad thought that his intellectual stores are, in a measure, lost to us; stores accumulated through fierce strugglings with early poverty and small opportunity. Let no young man or woman despair of success so long as he remembers this example of one who, though lacking opportunity until of age, so used his observation and his time as to secure a collegiate education, and to wring a true success from what might have been the barren field of defeat.

"'Let us hope that that power which decrees that no atom of matter and no impulse of force shall ever be lost, but shall still exist somewhere in the universe, has also decreed that no part of that crowning gift to man, the soul, can ever become extinct, but shall follow the law of its development, and live and expand in the universe, never growing old or weary, recognized and recognizing other souls forever and ever.

"'Upon this stupendous problem of immortality, Mr. Porter spoke with his usual modesty. Said he, "We should not make ourselves unhappy about this matter, but be willing to accept what has been prepared for us. If it is best for us to live again, we shall do so. I go to try the future without fear. If we do not wake again, it will be one long sleep, and we have no right to complain."

"'During his long illness he never was heard to complain, and when he saw that death was inevitable, made every preparation for it with great resignation. For those who, misusing the gifts and opportunities of life, die in the midst of a round of follies and sins, we may well drop the bitter tear. But for such as he, who, loyal to the right, strove each day to become more and more like his ideal man, we should offer no vain tears, but proceed on our journey, thankful for the bright example, and hoping and believing that somewhere, at some time, we shall encounter again his radiant smile and cheerful greeting. O. H.'

"William K. Kedzie, of the class of 1870, died April 14th, 1880, and his brother, Robert F. Kedzie, of the class of 1871, died Feb. 13th, 1882. These are mentioned together, though they do not so occur in order of time, because they so often come to our minds in the same thought. They may well be regarded as true sons to our Alma Mater, and brilliant examples of what, under the best conditions, she can produce.

"The leading events of their short lives are somewhat strikingly similar, yet in character and disposition they in many respects quite widely differ. Both were students of this college under nearly identical circumstances; both completed the course with the highest honors; both were engaged after graduation as assistants in the chemical laboratory; both pursued advanced courses of study in their special lines at eastern institutions; both early received important professorships in agricultural colleges; both discharged arduous duties excellently well; both were most enthusiastic in the study and promulgation of natural science; both were true Christian gentlemen of the highest honor and noblest bearing, and both met with untimely and lamented deaths at nearly the same age.

"William K. Kedzie was appointed Professor of Chemistry in the Agricultural College of Kansas in 1873. He brought to the irksome duties of this new position all his characteristic zeal and energy. Yet amid his many tasks he found time for valuable outside work. Among labors of this sort was a practical work on the Agricultural Geology of Kansas, a work which has been highly praised, and which gave him a reputation as a chemist and practical scientist which many a man much older in the profession might well be proud of. He visited Europe in 1875, and while there made careful study of German chemical laboratories, with a view of adopting their best qualities into a plan for a laboratory at the Kansas Agricultural College. Upon his return he prepared and presented such a plan. It was adopted, and the building constructed under his direction. In 1878 he accepted the professorship of chemistry at Oberlin University, which position he held until his death.

"A most interesting phase of his character was his untiring devotion to the advancement of science. His first independent efforts in this line were exerted here and for the benefit of this College. They were varied but always of value and successfully accomplished. He was one of the founders and most enthusiastic and efficient of the first members of the Natural History Society of this College, which has since proved so prosperous and useful an adjunct of the institution. Work in this line was continued during the remainder of his life. At the Kansas College he founded a Science Club, patterned somewhat after the fashion of the Society here, which proved prosperous and useful.

"Will. Kedzie was brilliant, quick as the lightning's flash, yet always composed, dignified, genial, kindly, generous; a brilliant man, yet none the less a true man; and one whose short life has brought to this, his Alma Mater, no small measure of credit and respect. He was but twenty-nine years old when he died. Few lives make such a record in so short a time.

"Prof. Kedzie was married in 1876 to Ella M. Gale, daughter of the Professor of Horticulture at the Kansas Agricultural College, by whom he had two children, who, with their mother, survive him.

"Robert F. Kedzie graduated in 1871, and for a short time thereafter turned his attention to fruit culture, but afterwards became connected with the chemical department of this College, where he labored efficiently during most of the time for seven years. Among his labors while thus engaged is not a little which will prove of permanent value to our State. For instance: he made analyses of over thirty different samples of soils from different parts of the State, the results of which work are now on exhibition, for the use of all who have need of them, in the office of the State Commissioner of Immigration at Detroit. Also twenty different samples of corn and mill stuffs, to determine their relative food value; forty-two samples of wheat, to determine proper time for cutting—so far as that can be determined by chemical analysis; also many samples of milk, honey, superphosphates, marls, etc., for various purposes. He seemed peculiarly efficient in this work—the result, doubtless, no less of his own persistent faithfulness than of the long and valued training which he received from his father and from Professor Johnson, of Yale, and Dr. Storer, of Harvard.

"In 1880 he went with his friend, Prof. Frank A. Gulley, to the newly organized Agricultural and Mechanical College of Mississippi. It was an enterprise, as many of us regarded it, in the nature of an experiment. It proved to be but a short one for poor Robert Kedzie; but it may have been very far from unsuccessful. The duties of his new position were perplexing and arduous. The Chair of Chemistry, to which he was called, had no accessories, no aids to instruction. He started in with nothing, but within a year he had succeeded in organizing, it is said, the best laboratory in the Southern States; this, too, beside conducting his classes in chemistry and physics, and doing drudgery in mathematics. Yet, withal, he had the energy and pluck to show himself of value in the public economy of the State by making useful analyses of fertilizers used in the South, and of mineral waters, marls, specimens of soil, and other things of the sort. Then, too, he founded in that new institution a scientific association, patterned, as was his brother's in the West, somewhat after our own Natural History Society—an institution which thrived while he lived, but—like many fond hopes and bright anticipations—died when he died.

"Full of high hope and happy under fairest prospects, Prof. Kedzie came north, last Christmas time, to marry the girl he loved. Returning with his bride to a happy home in the sunny South, he was seized a week later with a nervous fever from which, despite his strong constitution and stronger will, he died Feb. 13, 1882.

"He had been in the South but a short time, but he seems to have won respect and esteem on every hand. The public press of Mississippi, almost without exception, made mention of his death in terms of sincerest regret. Notably the Jackson Clarion, the leading organ of the State, referred to it as well nigh a public calamity. There is something peculiarly touching in the sentiment thus voiced, suggesting quietly that this bright life, so fair in its promises of good, so early taken from the ample fulfillment of those promises, may have had in it a deeper meaning and a nobler mission than even its possessor knew. He went not with the olive branch, it is true, but his life may have been none the less a peace offering, pointing as it did to that still nobler emblem, the Wreath of Laurels.

"George W. Long, a graduate of the class of 1874, died at his home in Dearborn, on the twenty-ninth of October, 1881. He was a young man, genial and true, and beloved by many friends. His life was exemplary in character and fair in its promise of good.

"For several years after his graduation he was engaged in bee-keeping at his Dearborn home, and at this he gained considerable success. He was twice awarded the first prize for excellence in this line upon his exhibits at the fairs of the State Agricultural Society. During these years, also, he devoted his spare time energetically to the study of music, in which art he attained a proficiency which a professional might envy. It is to his credit that he entered with zeal into the public affairs of his community, and was on several occasions honored with local office, serving for two or three terms as superintendent of schools in his native township.

"But he was laudably ambitious, and under these employments he was restive and unsatisfied. He wished for a field, as he imagined, of wider opportunities for advancement. To this end he began the study of medicine, and in 1879 entered the medical department of the Michigan University, from which he graduated in 1881. Immediately afterward he formed a partnership with an established physician in Vassar in this State, and assumed from the outset professional labors which severely tried his strength. During his course of study he had applied himself very closely and continuously, and his standing among his fellow students was exceptionally good. Entering upon new and more laborious duties without needed rest, his health became impaired. Still he continued confidently and faithfully at his work long after one less ambitious would have relinquished, He was taken with typhoid fever during a visit to his home, whither he had gone to attend the wedding of his sister; and from this he died but two weeks later. His remains were buried in Woodmere cemetery near Detroit.

"William A. Henderson, also of the class of 1874, died on the 18th of January, 1881. We used to call him 'Old Jack,'—poor fellow—and there was something about him that made most of us like him. The grip of his hand was firm and the inside of his heart was warm, and in his soul was a pretty good rugged sort of honor.

"He was born at Dayton, Ohio, August 15, 1848. In early life he seems to have roved around pretty much all over the country; but he landed up in 1869 in the old preparatory class of this College, and he graduated with the class of 1874. In 1876 he purchased a fruit farm at what is known as Peach Plains, a few miles out from Grand Haven; and here, from all that the writer can learn, he seems to have worked with great zeal and effectiveness. He built a commodious and pretty house, almost entirely with his own hands, for he was one of those fellows who can do anything from playing a guitar to fighting a duel—and he planted his farm to fruit trees which bore their first fruits in the year in which he died. He was married May 18, 1877, to Miss Ella R. Bemis, of Ionia county, by whom he had three children, one of whom has since his death been adopted by his old college friend, Ransom M. Brooks, of 1873. It is greatly to his credit that he seems to have been esteemed in the community in which he lived, and that he was several times placed in public office. He was elected Vice President of the Ottawa County Pomological Society, and twice elected Township Superintendent of Public Schools.

"Poor Jack was a most appreciative lover of all that is beautiful in nature and art. More fortuitous circumstances might have developed in him the rare qualities of the best manhood.

"Lyman Mason, of the class of 1869, died suddenly July 16, 1881, while engaged in his professional labors in extending the survey of the Jackson, Lansing & Saginaw railroad, at Gaylord, in this State. He was born in Owosso, February 14, 1847. He pursued his primary studies at the Owosso High School, entered this College in 1865, and graduated with the class of 1869. Two years later he graduated from the Scientific Department of the State University with the degree of Civil Engineer, and in 1876 he reached the degree of Master of Science from this College. He was married Dec. 24, 1872, and resided up to the time of his death at his native place, Owosso. He was very successful in his profession, having been engaged in a number of extensive and important railroad surveys, and at the time of his death was at work on the extension of the Jackson, Lansing & Saginaw railroad. He was an active member of the State Association of Surveyors and Engineers, which body adopted befitting resolutions concerning his death, and published his biography in their annual report. He was four times elected County Surveyor of Shiawassee county, and for many years was City Surveyor of his native city. It is said of him that "he was a fine and thorough student, an accurate surveyor and engineer, an industrious and successful man, and in every sense a most worthy citizen.

"Charles L. Jackson, of the class of 1870, died at his home in Midland sometime during the year 1881. The exact date of his death, as well as exact knowledge concerning the details of his life, the writer regrets that up to the time it was necessary to prepare this history he was unable to ascertain. Enough was learned, however, to warrant the saying of many good things about him. Mr. John Harvey, druggist of Detroit, with whom he was engaged for some six or seven years after his graduation here, referred to him in terms of highest commendation, saying that he was one of the most efficient, trustworthy, and valuable men he had ever had in his employ. Mr. George F. Beasley of Detroit, classmate and friend of Jackson, when approached concerning him, said: 'Jackson was a good fellow, real, solid, and substantial.'

"He seems to have been possessed of good and commendable ambition, for in 1877 or 1878 he severed his connection with Mr. Harvey and established himself in the drug business in Midland on his own account. Here he was apparently succeeding, and the prospects ahead seemed fair; but he was not permitted long to enjoy them, for in 1881 he died.

"Yet one more death remains to tell you of, my friends, 'ere this sad part of your history is complete. Henry E. Owen, of the class of 1878, died March 22, 1881.

"Bright, gentle Harry Owen, who loved the flowers so dearly, and who loved his friends so well. His happiest moments were spent in making others happy. Quiet, retiring, meek and mildly mannered; such character he had as it is a relief to meet. Poor boy! he lived only to enjoy the morning of life, but all the world was beautiful to him as a maiden's dream.

"He was born in Adrian, Michigan, on the 21st of August, 1856. His parents were English people, natives of Kent, but had long lived in America.

"He very early evinced a great delight in the beautiful things of nature, the flowers specially, and the shrubs and trees and streams and the big woods. This trait was his leading characteristic.

"He received his early education in the schools of his native city, entered this college in 1875, and after his graduation with the class of '78, pursued a post graduate course in his special studies, which included botany and horticulture. He was appointed assistant in these branches at this institution in 1880, which position he held but a short time until his death, which occurred in March of the following year.

"He was as dearly loved as any of our dead, and by the later members of our brotherhood is perhaps most sorely and most sadly missed.

"These, then, dear friends, are our brothers who are gone,—our mother's sons, whom she might well have held out as her jewels; and your historian has mentioned each thus fully as he well could, because each seemed worthy of all that could be said. They were among our brightest and our best; singularly so it seems to me. Not one of them but had rare merits, not one but left fair memories behind. Not one—so far as information upon the subject has been received—but that laid down this life in the hope and fair expectation that he would take up another and better existence in the life to come. It may be that poor Long's sweet melodies—which mightily pleased many of us who knew him well—still re-echo with even softer harmony; and it may be that gentle Harry Owen will gather sweeter flowers in the greener fields whither he has gone."

The banquet was very enjoyable. Hon. Charles W. Garfield, class 1870, acted as toast-master.

The following were elected officers for the three years ending with the close of the reunion of 1885: President, S. M. Millard, class 1864; Vice Presidents, Benj. T. Halsted, '73, Frank A. Gulley, '80; Secretary and Treasurer, Prof. R. C. Carpenter, '73; Orator, Prof. E. M. Shelton, '71—alternate, W. K. Prudden, '78; Historian, President C. L. Ingersoll, '74—alternate, E. Davenport, '78; Poet, O. A. Angstman, '75—alternate, W. R. Hubbert, '81.

STUDENTS.

There should be added to the list of students given in the catalogue for 1880–81 the following names:

Resident graduates: E. B. Patterson, B. A. (Oberlin), Elyria, Ohio; W. C. Latta, B. S., '77, Mason, Ingham county; G. F. Failyer, M. S., Kansas Agricultural College, Manhattan, Kansas.

Juniors: L. H. Bailey, Jr., South Haven, Van Buren county; F. C. Snyder, Greenville, Montcalm county.

Specials: Frank F. E. Lodeman, Ypsilanti, Washtenaw county; Erwin F. Smith, Ionia, Ionia county.

The following names of students are to be added to the catalogue of 1881–82: W. M. Babcock, Taunton, Somerset county, Eng., special in Entomology; H. H. Harrington, senior in Mississippi Agricultural College, special in Chemistry; Fitz Roy Osborn, Parkville, St. Joseph county, Freshman; Ella Sherwood, St. Joseph, Berrien county, special in Chemical Physics; Ada Belle Smith, Mosierville, Hillsdale county, special in Entomology.

The number of students in attendance has been:

	1880-81.	1881-82.
Resident graduates	3	2
Seniors	33	29
Juniors	35	31
Sophomores	53	56
Freshmen	90	82
Specials	14	21
	228	221

In 1880–81 there was one lady in the senior class, two in the freshmen class, and four in select studies.

In 1881–82 there was one lady in the senior class, two in the sophomore class, two in the freshmen class, and four in select studies.

Counties, States, and countries have been represented as below:

	1880-81.	1881-82.		1880-81.	1881-82.
Allegan	--------	1	Lenawee	5	5
Alpena	--------	1	Livingstone	6	6
Baraga	--------	1	Macomb	2	1
Barry	3	5	Manistee	2	2
Berrien	8	10	Mason	1	1
Bay	--------	1	Mecosta	1	--------
Branch	4	--------	Montcalm	3	2
Calhoun	1	4	Muskegon	--------	1
Cass	1	1	Oakland	17	15
Charlevoix	--------	1	Oceana	3	1
Clinton	4	5	Ontonagon	1	1
Eaton	9	11	Otsego	1	--------
Genesee	1	1	Ottawa	3	4
Hillsdale	6	2	Saginaw	1	--------
Houghton	--------	1	Sanilac	1	--------
Ingham	36	30	Shiawassee	7	6
Ionia	21	15	St. Clair	1	3
Isabella	2	--------	St. Joseph	8	6
Jackson	5	4	Tuscola	--------	1
Kalamazoo	6	6	Van Buren	16	18
Kent	12	9	Washtenaw	1	4
Lapeer	5	5	Wayne	2	2
Leelanaw	1	2			
Colorado	2	--------	Louisiana	1	1
Connecticut	1	1	Massachusetts	--------	1
Dakota territory	--------	1	Mississippi	--------	1
District of Columbia	1	1	Nebraska	1	1
Illinois	2	2	New York	4	5
Indiana	3	--------	Ohio	4	3
Kansas	1	--------	South Carolina	--------	1
England	--------	1	Japan	1	1

Average of classes in catalogue.

	1880-81.		1881-82.	
	Years.	Months.	Years.	Months.
Class of '81	22	10		
Class of '82	22	1	23	
Class of '83	20	8	21	6
Class of '84	19	11	21	
Class of '85			19	6

MILITARY DEPARTMENT.

The Congressional grant of lands by a clause, "and including military tactics" seems to require military drill in the College, and a State law (1863) created a "military department" in the institution, but made no provision for defraying the expense of it. The State has a deposit of sixty stand of arms and equipments at the College. A room has been fitted up in the basement of Williams Hall as an armory.

The Board is in correspondence with the War Department in Washington relative to an officer for giving instruction in Military Science and Tactics in the College.

On the outbreak of the rebellion the students formed a company, "The Plow-boy Guards." The students were inexpensively uniformed, had drill, and were once received upon the field and addressed by Governor Blair. The company, in a body, visited the Hon. Wm. H. Seward, and were addressed by him.

Courses of lectures were also given the students in a body in field fortifications and military hygiene by Dr. Kedzie and other officers, but of late years the military company has been a voluntary association, at times carried on with some spirit, and at other times neglected.

In 1880 I called attention to the fact that the amount of interest now received from the congressional land grant rendered it fitting to inquire what the terms of the grant require of us in the way of military instruction. Since that time a petition has been received, signed by nearly all the students, asking for the organization of such a department.

VETERINARY SCIENCE.

Instruction in veterinary science has been given to the two senior classes, 1880–1, 1881–2, by Dr. A. J. Murray, Veterinary Surgeon, Detroit. It was limited to six weeks daily lectures for each year. Dr. Murray was a pupil of Doctors Law and Gamgee, and afterwards a lecturer in the Royal Agricultural College of England, and in Edinburgh; he was highly recommended by Dr. Law, of Cornell, as a lecturer. His position is but temporary, The Board contemplate extending the course of lectures to a full term. A full year's course would be better. Professor Cook covers, in lectures on Comparative Anatomy and Physiology, a part of the ground of Veterinary Science.

MECHANICAL DEPARTMENT.

Estimates will be presented for a Mechanical Department. Messrs. Reynolds, of the Board of Agriculture, and Prof. Carpenter, of the faculty, wer appointed a committee to make recommendations regarding such a department, and I refer to Prof. Carpenter's report for an account of their work.

It is proper to say that it is not the purpose of the Board to establish a department holding a rank coördinate with agriculture, so that one can take his choice between mechanics and agriculture, but to make the department of Mechanics subordinate to the agricultural character of the institution, and to make the instruction in the mechanical department a part of the course in agriculture.

THE LIBRARY.

The library belongs to every department of instruction. The books have been placed in the new Library and Museum building, and arranged by subjects in the alcoves. The periodicals are handily placed for study. The reading room has been lately adorned by an oil painting, life size, of the President of the Board of Agriculture, the Hon. H. G. Wells, of Kalamazoo. Judge Wells has acted as virtual or actual President of the Board since its creation in 1861, and much of the present prosperity of the College is owing to his wisdom and untiring efforts. He has spared no time nor pains in serving the College, and we are all grateful to him for this gift of his likeness, and wish the time may be far distant when he shall cease to preside, as he has done for the last twenty-one years, at the sessions of the Board.

The College needs a librarian. The scientific works, to which the professors refer in their lectures, should no longer be drawn from the library to the rooms of students, where but one or two can use them, at the time when reference is made to them, but the library should be kept open during the hours when students study, and these books kept in for their use.

There are probably twenty-five scientific journals coming to the library, and many magazines filled with interesting matter. These periodicals need to be indexed as they are received. Half the value of a library is lost if it be not well indexed. The daily attention to the library, the indexing its contents, and the furnishing of aid to those who make use of it, so as to economize their time, is work enough for the full time of one man. We are now, by the lack of such service, behind the University, and all libraries of high standing.

THE LABOR SYSTEM.

The labor system has remained the same substantially as it was organized in 1861. Students have, since the opening of the College in 1877, labored three hours a day. It is a requirement of the organic law of the College.

The Sophomores work their entire year in the Farm Department. The Juniors work their year in the Horticultural Department. It was intended by this arrangement to give students in these classes an opportunity to see a year's work consecutively carried out in each department, to invite them to understand the year's plans, and to have them have a hand in carrying them out. If the lessons in agriculture were given in the Sophomore year, the lectures and the work would both be rendered more educational. It is worth inquiring if some such an arrangement cannot be made. Or, one hour a week might be given to the professors of agriculture and horticulture in which to meet the classes that work in their departments, and to describe the operations going on. Perhaps some plan may be devised by which the work in the departments for these two years might be classified, and each student be obliged to show some proficiency and understanding of each kind of work—

pass an examination and receive a marking number—a rank. Dr. Beal, whose experience has been of great value in the counsels of the College, has often enforced this or a similar plan.

To carry out such a plan would require a larger force of overseers than the departments have ever been able to command. Practice, to be most valuable, should be under skilled oversight, but it is impossible for one professor and one foreman to take immediate oversight of more than a small fraction of the work daily, and necessarily scattered over the departments. Novices in any work give imperfection in the products, and it would hardly be tolerated in the College that it should manifest everywhere that all its work was done by mere learners, so that we are obliged in some degree to compromise between the call for model work on the farm, and the call for work that shall afford practice to beginners. The work performed by students ought to be fairly well done, else the constant sight of imperfections will uneducate, or rather diseducate faster than the practice will educate.

Again, students in this College value the work system as affording them the means of paying in part their own way. Many students could not remain at the College but for this means of lightening their expenses; but mere practice under the eye of a skilled foreman is rarely the kind of real work, hard, genuine work, for which the College can afford to pay.

Dr. Beal's plan is again worthy of consideration—to require work regularly, on stated afternoons, which shall be educational, and performed without compensation. The problem how with students' labor to make the operations on farm and garden excellent of their kind, so as to serve for models; how to make students' labor worth to the institution what it costs in wages; and how to make it a highly educational practice, in which students may begin bunglers and end possessed of skill is something like the famous mechanical problem of the three round bodies, a hard one.

I have been grieved at some speeches and reports coming from men of other states, which assumed that the Michigan Agricultural College "put on airs" because of its labor system, and thought every other institution ought to follow its example. There is no such feeling here, I am sure. If Yale, with no farm, can make graduates like her own professors—the Johnsons, or Liebigs, promoters of agricultural science, we, with our farmer graduates, will gladly acknowledge the superior value of her work. Happy, indeed, are the college officers who are free from the bother of students' labor and students' board; but the State of Michigan desires to have the College return a good proportion of its graduates to the farm. Several wise college officers in the East and the West pronounce such an aim foolish. Nevertheless Michigan legislators, agricultural societies, granges wish it, and it seems to be proved that the labor system is essential to the accomplishment of this part of the duty of the College. But even as regards the great work of making a science of agriculture, something may be said for a system of manual labor. Nearly all inductive sciences had their growth through the combined observations of many and continuous observers. Agriculture needs such observers. Now an army of such observers will be made by the colleges that combine manual labor with study, and will be scattered widely throughout the land. The ignorant are for the most part incompetent to the observing and recording of the necessary facts, or to the trying and recording of the necessary experiments. The education afforded the college graduate needs not be very profound, nor very minute to make him capable of rendering great help in this way. To practice while one studies, and to do both under competent instruction is no small advance over getting theories at one time, and working at another time for an object wholly distinct from educational purposes. It has been largely the history of science that discoveries and inventions are made by those who were busy with their hands about the things wherein the improvements are made. The chemist uses his hands. Sir Isaac Newton ground his own lenses. The steam engine grows to perfection under those who manage it.

The few graduates whose taste and means make them to do work of a higher kind the College is glad to have remain as resident graduates, or to go to other and better equipped institutions.

I have given an account of the labor system report, 1879, pages 182 to 188.

We have at times made good use of members of the Senior class for supervision (see Dr. Beal's report, 1876, p. 98), and I call the attention of the Board to a plan presented by Professor Johnson, in his report in this volume.

IS THE LABOR SYSTEM FAILING?

At the last Board meeting I mentioned incidentally a rumor that students were excused from labor on slight grounds. It is due to the professor in charge of the department to say that the labor books were immediately brought to me for examination, and that there was no truth in the report. Labor has never been put on a complete par with classes in the College. It is difficult to get a majority vote of the faculty to suspend college exercises a day for the fair of the Central Michigan Agricultural Society, but there would be no opposition to granting the students *an afternoon,* that is, the *work* hours. No officer would excuse a student from class to help repair the road to the city—every one would approve of his being permitted to go in the afternoon. But this is not *new.* It was always so. At the present time both farm and garden report the students as doing excellent work—a foreman on the garden is a late graduate, and he speaks in high terms of the faithfulness and efficiency of the work. The reporting is as regular as it ever was in the history of the College, and the work as faithfully performed. I reiterate what I have heretofore said, that the students work as well as they study, and that they study here as well as in other institutions.

FARM INSTITUTES.

Six of these institutes were held in January, 1881, and six in 1882. There has been no change from the plan detailed in the report of 1875, page 72. The following is a complete list of the institutes, with the names of the officers having lectures or papers. The charge of organization on the part of college officers has been given to the various members of the faculty, the President excepted, whose official correspondence and reports are more than an equivalent for this duty.

1876.

Armada—Ingersoll, Baird, Garfield, Abbot.
Rochester—Same as at Armada.
Allegan—Fairchild, Kedzie, Cook, Carpenter.
Decatur—Same as at Allegan.
Adrian—Fairchild, Kedzie, Cook, Garfield, Abbot, Ingersoll.
Coldwater—Kedzie, Ingersoll, Baird, Abbot.

Dr. Beal and Professor Gulley were excused from service in this year's institutes.

1877.

Greenville—Baird, Garfield, Cook.
Traverse City—Baird, Kedzie, Beal.
Ypsilanti—Beal, Baird, Ingersoll, Abbot.
Hillsdale—Beal, Abbot, Ingersoll.
Owosso—Cook. Fairchild, Beal.
Lansing—Kedzie, Abbot, Ingersoll.
Professors Carpenter and Gulley were excused.

1878.

Marshall—Ingersoll, Kedzie, Fairchild, Abbot.
Paw Paw—Kedzie. Abbot. Ingersoll, Cook.
Tecumseh—Beal, Abbot, Kedzie, Ingersoll.
St. Johns—Baird. Beal, Ingersoll, Robert F. Kedzie, Abbot.
Saginaw—Cook, Carpenter. Fairchild, Beal.
Climax—Carpenter, Cook, Baird, Kedzie.

1879.

Bay City—Carpenter, Kedzie, Abbot.
Flint—Fairchild. Beal, Baird.
Charlotte—Beal, Fairchild, R. F. Kedzie, Ingersoll.
Howell—Ingersoll. Cook, Baird.
Centerville—Cook, Ingersoll, Abbot, Cassidy.
Dowagiac —Kedzie, Baird, F. A. Gulley.

1880.

Rockford, Kent Co.—Beal, Frazer, R. F. Kedzie.
Big Rapids—Beal, Frazer, R. F. Kedzie.
Manchester —Baird, Abbot, Frazer, F. A. Gulley.
Romeo—Baird, Abbot.
Buchanan—Carpenter, Cook, Cassidy.
Mason—Carpenter, Cook, F. A. Gulley.
Dr. Kedzie was excused from service.

1881.

Ionia—Johnson, Beal, Carpenter, Baird, Abbot.
Bangor—Kedzie, Cook, Baird, MacEwan, Frank Kedzie.
Hudson—Baird, Abbot, Johnson, Beal.
Battle Creek—Beal, Johnson, MacEwan, Abbot, Cassidy.
Oxford—Carpenter, Cook, Kedzie, Cassidy.
Vassar—Cook, Carpenter, Kedzie, Abbot, Latta.

1882.

Cassopolis—Kedzie, Abbot, MacEwan, Frank Kedzie.
Leslie—Beal, Abbot, Carpenter, Johnson.
Berlin—Johnson. Beal, Baird, MacEwan. Latta.
Greenville—MacEwan. Abbot, Kedzie, Beal.
Lapeer—Carpenter, Johnson, Harrower.
Macon—Carpenter, Kedzie, Baird, Harrower.
Professor Cook was excused from service in these institutes.

STUDENTS' GOVERNMENT AND OTHER ORGANIZATIONS.

At the beginning of the college year, 1881–2, the students changed the form of their organization for self-government, so as to provide for trials by jury in place of by a permanent council. The plan was found unwieldy, and the organization lost efficiency. Near the close of the year a simplified form of jury trial was adopted, which seems to be working satisfactorily.

The Christian Union has been changed, with the consent of the Faculty, into a college branch of the Y. M. C. A.

The Natural History Society has held its meetings monthly. The meetings have been well attended and highly interesting.

While the College Brass Band has been well kept up, the military company discontinued its drill before the close of the spring term of 1882, and the arms on deposit are not now used.

The College was represented in the Agricultural Conventions in Washington, D. C., in January, 1882, called by the U. S. Commissioner of Agriculture, by Hon. F. Wells, a member of the Board, and by the Secretary, Rev. R. G. Baird.

SOCIETIES OUTSIDE OF THE COLLEGE.

On the 2d of June, 1881, the State Board of Agriculture, the officers of the State Agricultural Society, of the State Horticultural Society, of the State Grange, and of the State Pioneer Society spent a day together at the College. After an examination of the College, a general gathering of the visitors, College officers, and students was held in the chapel. A similar visit was paid the College by the officers of the State Agricultural Society in June, 1882. The relations of the College and these societies is most friendly, and the Agricultural Society and State Grange have regularly appointed committees on the College—committees that pay the institution not infrequent, unannounced, but always welcome visits.

A gathering of college professors of agriculture held a meeting at the College June 28, 1881, a further notice of which is to be found in the report of the Professor of Agriculture.

VACATIONS.

The college term continues from February through the hot weather to the last of August with a vacation in May of one week. The long vacation is in winter. This change of vacation from summer to winter was made to accommodate students who needed to teach, in accordance with a suggestion made by President Williams in these words (report Superintendent Public Instruction, 1858, page 32): "It has become manifest from the experience of two winters, that the most advanced students will, many of them, be compelled to teach school during the winter months. This will prove a serious embarrassment to the College and themselves. It is worthy the deliberation of the Legislature whether the organic law of the institution might not be so changed as to throw the whole, or nearly the whole, of the vacations of the year into midwinter."

This change was made. It is, I believe, of prime importance that the College should continue to draw its students largely from the farming class, and that expenses at the College should be moderate. As long as students are *obliged* to teach, it will be best to continue to put our long vacation in the winter. But the necessity of teaching is a very unfortunate one to the student. He generally leaves College a few weeks before the close of the autumn term, works hard all winter in a close school-room, and returns to college duties in the spring wearied out, and perhaps behind his class by a few weeks' lessons. By the time he has worked through two years of term time and two winters of school teaching without rest, much of the vivacity of his mind is gone, and his health is materially impaired. This is a common experience.

It would be much better for their health and scholarship, if students could afford it, to take a two-months' vacation in the summer, when their parents are clamoring for them to come and help in haying and harvesting, get a good rest from in-door labors, and a few months of out-of-door exercise free from books. Doubtless enough students to carry on farm and garden operations would always be ready to remain at the College during such a vacation.

Winter is a good time to study, but the experience of all colleges is against the continuance of college classes during the hot months of July and August, and I can remember but one other college than ours that continues its term through them. The practical instruction in agriculture is perhaps at its least in these harvesting months.

I say again, that as long as a large part of our students are obliged to teach, I have no change to suggest. When that necessity is gone, as some time hence it will be, if that time has not already come, I have no doubt we shall do well to follow other colleges in their distribution of vacations.

DEPARTMENTS OF THE COLLEGE.

In my report for 1878 I gave a brief account and history of each of the departments of the College.

The several professors and superintendents and curators have made reports covering the two years ending Sept. 30, 1882. These reports complete the view of the condition of the College at the present time, supplementing my brief account of them here. The College catalogue gives, not only the course of study in the institution, but a detailed presentation of the instruction given in each department.

President and Professor of Psychology and Logic.

On a six weeks' leave of absence granted me in the summer of 1881 I took three weeks' rest. I have no class during the last six weeks of the summer term, and my other duties were kindly taken for me by Messrs. Carpenter and Baird.

I have taught psychology and logic to each Senior class, using Bascom's Psychology, Jevon's Logic, and Fowler's Logic as guides. I taught the Constitution of the United States, using Cooley's Constitutional Text Book, to the Senior class of 1881, and Bascom's Ethics to that of 1882. Ethics was added to my department, and the Constitution of the United States taken from it, and made a part of that of History and Political Economy, in order to secure a greater unity to that newly constituted department.

I have had charge of the daily morning devotional exercises of the students. No other officer attends them. I have had charge of the services on Sunday afternoons, and have taken charge of them thirteen times out of a total of sixty-six. Sec. Baird has officiated three times. I have felt it incumbent on me, more than other officers have upon them, to be present at the weekly Wednesday afternoon lectures and orations, and have taken my turn in lecturing, having given, March 2, 1881, a lecture on the study of Grecian History and Literature, for one unacquainted with the Greek language, and on

Sept. 28, 1881, a lecture on the Prejudices Regarding Education that have come down to us from the middle ages. I have met (except for one term) the Captains and Lieutenants weekly for consultation on college order, and I have opened my house once a month to a reception by myself and family to students, officers, and other employés at the College, and their families. I have also, by request of the faculty, made all assignments of rooms to students, and taken charge of the exchange of reports and catalogues with other institutions of learning. I have attended and taken part in the Farmers' Institutes to which I was assigned by the Board.

This enumeration is of course wholly aside from, and in addition to my duties as chief executive officer of the College, as a member of the Board, and as connected with the Secretary in most matters of accounts.

Discipline.

As to discipline the faculty is the legislative body, and I desire to govern in accordance with their will.

For several years it had grown into a habit with me not to report to the faculty the minor infractions of law, but by seeing the students, talking with them, and gaining the aid of officers and prominent members of the societies to which they belong, to lead students to self-control, and a freely chosen obedience to rule. While I have insisted that with the president and faculty rests the final decision of each case, I have taken the students into free counsels regarding college matters, explained reasons of college rules and discipline, and heard all their opinions and wishes. I have not compelled them to inform of each other, but have required them to give any and all information regarding themselves. I have never acted as a spy, nor employed others to do so, nor by any way of questioning pretended to any knowledge of students' doings that I did not have.

There would of course be failures in discipline under this method of proceeding, and the best successes would often appear to be failures, when it was heard that some offenses had been committed and not made the subject of faculty discipline. I have no reason to doubt the substantial wisdom of this course of proceeding, nor have I had in the main cause to regret the freedom allowed to students in representing their own views, believing it to be better to run some risks of disorder for a large gain in self-government. The moral condition of students was never better than now. Profaneness, drinking, and other gross vices were never so infrequent, and the reports of the officers show a zeal in study and standing in classes never before so uniformly high. However, this plan does not meet with the approval of the faculty, and I cheerfully join with it, in its way; and in obedience to its will offenses are now reported to the faculty for faculty investigation and discipline, and students are required to tell all they know of the actions of other students. The average age of the students in the Freshman class is nineteen and a half years, and of the Senior class twenty-three years, making a treatment of them as gentlemen, possessed of large liberty, reasonable and safe. They are held closely to all required exercises.

Exchange of Reports.

Reports are exchanged, free of postage, with all other institutions endowed wholly or in part by the Congressional grant of lands. So far as this College is concerned I have made it a personal duty to see to sending off our reports for nearly every year since these colleges began to exist. I have reason to believe that the name of the bound volume which we issue has deceived some institutions into the belief that our reports had not been sent. In this State the Board of Agriculture has no existence except through the law organizing the Agricultural College. The reports of this College are therefore bound with the title, "Michigan Board of Agriculture." In nearly all the States the Board of Agriculture has an existence independent of the College, and the chief duties of the Board are not related to the college.

It has been thought desirable to preserve and bind the reports and catalogues of other similar institutions, and institutions are requested to complete for our library their issues of reports and catalogues.

We have the following documents, mostly bound into volumes, those of each institution by itself. From

Alabama: East Alabama College, afterwards State Agricultural and Mechanical College—catalogues, 1870, 1873, 1880–81; reports, 1875–6, 1881.

Arkansas: Reports, 1st, 1872; 3d to 7th, June, 1879, containing catalogue.

California: Register, 1870, 1872–3, 1874–5, 1877–8, 1878–9, 1879–80, 1881–2; Prof. Hilgard's report, 1877, 1879, for two years 1880.

Colorado: State Agricultural College catalogue for 1881.

Connecticut: Annual report of Sheffield Scientific School of Yale College from 1866 to present time; Yale College catalogues, 1841–2, 1844–5, 1857, to the present time; Yale College statements, 1868 to present time.

Delaware: Delaware College catalogue, 1871 to 1875, 1880.

Florida: Report of Superintendent of Public Instruction, 1871, 1876–7–8.

Georgia: University catalogue, 1873, 1874, 1876, 1879, 1880; 1st report State College of Agriculture and Mechanic Arts, 1874.

Illinois: Industrial University, 1st report 1867, and reports and catalogues to present time; W. C. Flagg's pamphlet on the University.

Indiana: Report to trustees of Purdue University by Richard Owen, president-elect, 1873; annual report, Oct. 31st, 1874; annual reports, 1st 1875 to present time; registers, 1874–5 to the present time.

Iowa: State Agricultural College, report of secretary, 1859; 1st annual report, 1858–59; 4th, 1863; 5th, 1864; 1st report of trustees, Jan., 1866; 2d report of trustees, Jan., 1868; addresses, March 17th, 1869; 3d biennial report, Jan., 1870, to present time.

Kansas: Agricultural College reports and catalogues from the first catalogue in 1863 and the report of Dec., 1868, to the present time.

Kentucky: Charter, statutes, and laws, 1866; catalogues, 1865, 1866 to 1871 inclusive, 1873, 1874, 1876 to 1881; Dr. Patterson's address, 1882.

Louisiana: University, Agricultural and Mechanical College, catalogues, 1877–8, 1881; 3d annual report, 1877.

Maine: Agricultural College; report of legislative committee, 1849; bill, 1869; reports and catalogues from the first, 1867, to the present time.

Maryland: Agricultural College, 1st circular, 1859; catalogues, 1865–6, 1868–9, 1871–2, 1872–3, 1877 to the present time; report, 1880.

Massachusetts: Agricultural College—Report in senate, E. O. Haven, 1863; reports in full from 1865, the first, containing catalogues. School of Technology—Catalogues in full from first in 1865; annual reports, 1871, to the present time. Harvard—42d report of 1867–8, 46th annual report 1870–71 to present time; catalogues for various years.

Michigan: University—Catalogues for 1853–4, 1856 to present time.

Minnesota: Reports from 1871 to present time; various calendars.

Mississippi: Report of Hilgard on organization, 1871; report of legislative committee, 1882; catalogues, 1st annual, 1880–1 to the present time.

Missouri: University—catalogue, 1867; reports and catalogues since 1870; addresses at inauguration of Dr. Laws, 1876. School of Mines, 1873 to 1876, 1879.

Nebraska: University—1st announcement 1871–2; catalogues 1871–2 to 1876; reports, 1873; chancellor's, 1875; 3d biennial, 1876; experiments, 1880.

New Hampshire: Dartmouth College and College Agricultural and Mechanical arts; 2d annual report of Agricultural College, 1868; 10th report, 1876; catalogues, 1855, 1867 to 1869, 1872 to 1875–6.

New Jersey: Rutger's College report, 1865–6, 1867, 1868; 8th annual report for 1872; 10th, 1874; 11th, 1875; 13th, 1877 to the present time; various catalogues, including 1881–2.

New York: State Agricultural College—report, 1858, 1859; charter, etc., 1859. Cornell University—report of committee on organization, 1866; 1st general announcement, 1868; catalogues, 1868–9; University register, 1868–9 to 1871 inclusive; 1872–3 to 1879–80, 1881–2; laying of corner stone of Sage University.

North Carolina: University—catalogues, 1869, 1875 to present time; reports, 1869, 1878.

Ohio: Agricultural and Mechanical College, afterwards State University; reports in full from 1st in 1870.

Ontario: School of Agriculture; reports, 1872, 1876, 1878 to present time; circular, 1877, 1880.

Oregon: State Agricultural College; catalogues, 1871 to 1877; reports, 1874, 1878.

Pennsylvania: Farmers' High School, afterwards Agricultural College, now State College; reports, 1858, 1859, 1864, 1866; reorganization 1st annual report, 1869, 1871, 1872, 1874, 1875, 1876, 1879–80, 1881; catalogues. 1859, 1860, 1862, 1864, 1869, 1871, 1872, 1874–5, 1880–81, 1882–3; experiments in 1881–2.

Rhode Island: Brown University—Catalogues, 1867, 1871, 1873, 1875, 1879; reports, 1869, 1871, 1874; report of Agricultural Department first, second, and third annual for 1864–5–6; general catalogue, 1869.

South Carolina: Circular of Claflin University, 1872.

Tennessee: University—Catalogues 1867–8 to the present time; reports, 1869, 1873 to the present time.

Texas: Agricultural and Mechanical College—Reports, 4th annual, 1880, 1881, 1882; catalogues from the first, 1876–7 to present time.

Vermont: University—General catalogue, 1791–1875; catalogue, 1866–7 to present time; 2d annual report, 1867 to 5th, 1870; 6th report, 1st biennial, 1873–4, 1875–6, 1877–8; laws of the College, 1874.

Virginia: Agricultural and Mechanical College—History and organization; catalogue 1872–3, 1881–2; report 1873, 1877, 1878, 1879; Mr. Ruffman's report, 1880; university catalogues; Hampton Normal and Agricultural Institute, 1874, etc.

West Virginia: University—Catalogues, 1871, 1872; reports, 2d annual, 1869, 1870, 1871.

Wisconsin: University—Report, 1865, 1868 to present time; catalogues, 1867 to present time.

HISTORY AND POLITICAL ECONOMY.

This newly constituted department is in charge of Professor George H. Harrower. The Freshman class have a term in Ancient and Mediæval History, the Seniors a half term in the Philosophy of History, a half term in the Constitution of the United States, and a term in Political Economy. If time could be found for a term in Modern European History, and one for United States History, the course would be greatly improved.

Professor Harrower has done a large amount of work in the department of English Language.

ENGLISH LITERATURE AND LANGUAGE.

This department is in charge of Prof. Elias J. MacEwan. The labor, however, involved in it is too great for one man to perform, and help has to be called in from other departments. Prof. MacEwan's report gives the work in detail.

French has been displaced from the course of study, and its three terms given to the fuller study of the English Language.

CHEMISTRY.

The chemistry department covers the wide range of elementary chemistry, analytical chemistry, chemical physics, agricultural chemistry, and meteorology.

The course of study begins with the beginning of the Sophomore year, and runs continuously through two years.

The chemical laboratory has been much enlarged and the lecture room made very light for delicate experiments. Excellent apparatus, a mineralogical museum, a sorghum mill, and crops grown by the farm or garden are the equipments of the department. The department made an exhibition at the State fair in Detroit in 1881.

At present the department is engaged in experiments on sorghum, the Legislature having made, unasked, an appropriation for the purpose of $1,000.

The chemical department is in charge of Robert C. Kedzie, M. D., since the spring of 1863. His assistant is Frank S. Kedzie, M. S., class 1877.

FARM.

The catalogue gives an account of the farm department. The class room instruction consists of a course of lectures to the Freshmen twelve weeks, and another to the Seniors twelve weeks. Between the two courses the students will have had botany, chemistry, agricultural chemistry, comparative anatomy, and physiology, and other branches more or less closely allied to practical agriculture. The department is in charge of Professor Samuel Johnson, assisted by the foreman, Abram S. Birch, and, at times, an assistant in experiments. It has command of a herdsman, two teamsters, and a student force equal to that of the Horticultural Department.

The Legislature, 1881, made, unasked, an appropriation of $1,000, for experiments, chiefly in ensilage; for an account of which, as well as for the large improvement in stock, buildings, and other farm matters, reference is to be made to Professor Johnson's report.

ZOÖLOGICAL DEPARTMENT.

The zoölogical department is in charge of Professor A. J. Cook, since 1869. The subjects of instruction are anatomy, physiology, and entomology, in lectures daily to the Juniors for two and a half terms, and a term's lecture in zoölogy and geology, one-half term each in the Senior year. A zoölogical museum and an apiary are in charge of the professor.

MATHEMATICS AND CIVIL ENGINEERING.

This department is in charge of Professor Rollo C. Carpenter, since 1878, assisted by Mr. Louis G. Carpenter, class of 1879.

The departments are pure mathematics, mechanics, surveying, leveling, civil engineering, and astronomy. The instruments for illustration are of excellent quality. An observatory is furnished with a telescope of Mr. Alvan Clark's manufacture, a clock, etc.

Topographical and other surveys, leveling for drains, and all repairs in brick and iron, the charge of the heating arrangements of the College, and of water pipes, are with Professor Carpenter.

BOTANICAL.

This department, from the first of January, 1883, will be as distinct from that of horticulture as two departments so nearly related, and mutually dependent on each other, can well be; but its limits have not been as yet well defined.

William J. Beal, M. S. Ph. D. is, since 1871, in charge of it. He has had an assistant in horticultural experiments during the last two years, Mr. James Troop, M. S., a graduate of the class of 1878.

The instruction in botany begins in the summer term of the Freshman year and continues through that term and a half of the autumn term. The class is generally so large as to require instruction in two divisions. The Seniors have laboratory work in botany two hours a day during one-half of the spring term. Dr. Beal has given lectures one-half of the Sophomore year in landscape gardening. The equipments of the department are a commodious building containing class-room, office and botanical museum, a large collection of dried plants, collections of woods and other specimens, compound solar microscopes, enough for a Senior class of thirty; beds of grasses, a botanical garden, and an arboretum. The park, with its trees and shrubs labeled by Dr. Beal, the garden, orchards, and the farm, all furnish materials for the study of botany.

HORTICULTURAL DEPARTMENT.

This will be from January 1, 1883, under the management of James Satterlee, M. S., a graduate of the class of 1869, Professor elect of Horticulture, assisted by a florist, Mr. James Cassidy, and a foreman.

It will command two teams, two teamsters, and a working force of students equal to that of the farm department. The department will have charge of the College Park, the vegetable garden, the orchards, the nurseries, plantations of small fruits, the greenhouse, and adjacent beds and borders, and the drives and walks.

The class instruction, as at present laid down, consists of a course of lectures on Horticulture to the Junior class in the autumn term, but the duties of the professor are not yet fully laid out.

At present this department has a small horse barn, and a greenhouse. It lacks a fruit house, and other desirable means of separate and efficient work.

THE PARK.

Directly east of the main entrance to the State capitol is a wide avenue, which terminates three and a half miles distant, at the gate of the grounds of the Michigan State Agricultural College. These grounds are 676 acres in extent, and are separated into two parts by the Red Cedar River, a small stream whose source is thirty miles away. The college farm is mostly on the south side of this river, and the buildings are all in one large park of about 100 acres on the north side. The college park has been laid out in the main by Mr. Adam Oliver, a landscape gardener of Kalamazoo, Mich. He is not responsible for the drive from the chemical laboratory to the greenhouse, nor for the drives near the new library building. There are in the park no straight rows of buildings or of trees, but its more than thirty buildings, if barns be included in the number, are separated by undulating lawns, shallow ravines, and groups of trees. In one place only the method of grouping trees is departed from, for along the highway, a mile in extent, a double row of elms, one without the fence and one within, forms a double walk along the road.

There are three entrances to grounds, but the west one, being nearest the city, is most used.

The drive from this entrance ascends a hill, and, leaving a pear and a cherry orchard on the left, keeps near the steep river bank on the right. At the top of the hill the drive divides, the left hand road passing by the president's house, a small astronomical observatory, and seven dwelling houses for some of the officers of the College. The right hand drive follows the winding river bank, passes the apiary on the left and the new botanical laboratory, and crosses a ravine near the wild garden by a rustic bridge, modeled after one in the New York Central Park. From this place walks and drives diverge to the College Hall, the boarding hall, the greenhouse, the chemical laboratory, the library and museum, and other buildings. Beyond this group of buildings are the farm house, the farm buildings, and the carpenter shop; still farther on are the vegetable, the small fruits and the apple orchard, and the bridge that leads to the main part of the farm. The trees and shrubs have been labeled by Dr. Beal, the Professor of Botany, with their scientific names and their common names, and in 1878 a catalogue of many of these trees and shrubs was printed in the report of the Board. There have been important additions since that time. During the past two years the courses of lectures in horticulture were delivered by Dr. Beal. He had charge of out-of-door work during the autumn of 1880. From March, 1881, to the close of present time the charge of the work has been in the hands of Mr. Louis Knapper, excepting the greenhouse, which during that time has maintained an independent place among the departments. Neither the Horticultural Department outside of class-room, nor the greenhouse have had a representation in the faculty. Mr. Cassidy, florist, was very sick from August, 1881, to March, 1882, and unable to give much personal attention to his duties. During this time Mrs. Cassidy took charge of the work of students with great energy and skill.

Mr. Knapper has made many and marked improvements upon the grounds and in the departments generally. Mr. Knapper has felt that the team work in the department was insufficient. In this respect he has but reiterated the opinion of Dr. Beal, his predecessor, who emphasized it by formally asking the President what portion of his duties he should neglect. Dr. Beal kept his own horse at work on the college grounds a large part of the time, so that

Dr. Beal had more team work than Mr. Knapper. The Board propose to increase the amount of team work allowed to the department.

Mr. Knapper's report made in August, 1882, will be appended. As the necessity of making the department more united and of giving it a representation in the faculty has induced the Board to create and fill a chair of horticulture, and as this will render the office held by Mr. Knapper unnecessary, I take this occasion to say that Mr. Knapper has shown himself a skillful manager, as successful in the employment of students as officers usually are at first. He possesses the respect and esteem of the students, and is known as a gentleman, considerate of the rights and regardful of the wishes of all. I do not remember any more successful management of the work on the whole than his, and I regret to lose both his services and his society.

THE ORCHARDS.

The apple orchard was planted by President Williams in 1858. Successive superintendents of the Horticultural Department have failed to make of it a good orchard. Dr. Beal especially tried many experiments in methods of cultivation, but at last pronounced the orchard wholly unsatisfactory. Mr. Knapper advised making fire-wood of it, but it not seeming best to cut down an orchard which occasionally gives a fair crop, he tried the heroic treatment of pruning quite large branches off the trees, reforming their shape, and opening the branches to the sun. He thinks the same process should be repeated two years longer. It is too early to report on the effect of this treatment.

It is not meant that the apple orchard does not give us fruit, but that it fails to meet the ideal of a good orchard, or even to compare favorably with excellent orchards in the State.

On a clay soil near the west entrance, Dr. Beal planted an orchard of small fruit and a vineyard, which are a part of the Horticultural Department. There is a small vineyard, also, near Wells Hall, on terraces in the bank leading to the low lands along the river, and there are raspberries and strawberries near the apple orchard.

The vegetable garden is west of the apple orchard, and a prominent part of the department.

The greenhouse and borders near it are a great attraction to visitors. The beds of variegated leaved plants and of flowers, both near the greenhouse and about the grounds have been made by Mr. Cassidy (here since 1874) very beautiful.

CONCLUSION.

All the departments have made progress in their development. Officers have been more and more relieved of work in studies not related to their professorships; means of illustration have been multiplied, the library enlarged, and increased accommodations given to us, by a generous State acting through their legislatures. On our part, the Board have given much time and care to the management of these legislative gifts, and the faculty have been untiring in their work in their departments and for the College at large.

DEATH OF HON. JAMES WEBSTER CHILDS.

Subsequently to the writing of my report comes the news of the death of Hon. James Webster Childs, member of the State Board of Agriculture. A parting tribute to his many excellencies of character and his highly useful public life cannot here be given, but a sketch of his life and his connection with the College cannot be omitted without doing violence to the feelings of all who have been associated with him in College affairs.

Mr. Childs was born at Henniker, New Hampshire, the youngest of ten children, one of whom now occupies the "old homestead," the home of Mr. Childs's father and grandfather. The widely spread family held a reunion in 1872 at Niagara Falls, and it was manifest that they were a race of industrious, honorable, intelligent, and religious men.

Mr. Childs completed his preparation for a college classical course in New Hampshire but was forbidden to take the course by his physician. Most deeply disappointed in his longing for a college education he followed some of his elder brothers to Michigan in 1848, having the same year married Miss Lucy A. Hubbard, Claremont, New Hampshire, who survives him, and bought the farm in Augusta, Washtenaw county, upon which he has always lived. He united with the Congregational church in his native town at 15 years of age, and aided in establishing the Congregational church in Augusta in 1854. From that time until his death he has been the superintendent of its Sabbath-school. His neighbors and towns-people have much cause to mourn his loss. Tender and affectionate as a woman, he was constantly busied for the improvement of them all. Until prescribed for him in his last illness he had never tasted intoxicating liquors, and was an ardent advocate of temperance. He entered heartily into the grange movement as being a highly educating social force. He interested himself in the schools, in agricultural associations and fairs equally warmly and efficiently, whether for the neighborhood or for the whole State, and held many offices of trust and honor in them all.

Mr. Childs served two terms in the House of Representatives and four in the Senate, taking a prominent part in all public measures, and carrying into politics the high sense of honor and conscientiousness for which he was known in private life. He was a member of the Republican party which he had helped to form.

Mr. Childs was the well known and efficient friend of the University, the Normal School, and the Agricultural College. He was put upon our board—the State Board of Agriculture—by Governor Baldwin, and reäppointed for a second six years by Governor Bagley, and had completed about two years of a third term under the appointment of Governor Jerome at the time of his death. He could not have devoted more unselfish solicitude for a private interest than he did for the welfare of this college. He belonged to a board in which parties and dissensions have been unknown, and we feel his loss as that of a brother. His death occurred Nov. 8, 1882. At his funeral his clergyman and some of his intimate friends, and Hon. Thos. W. Cooley, of the supreme bench, and the president of the Agricultural College all testified to the reputation of his worth and our sense of the greatness of our loss.

Respectfully submitted,

T. C. ABBOT, *President.*

REPORT OF THE PROFESSOR OF AGRICULTURE AND SUPERINTENDENT OF THE FARM.

To the President:

I herewith submit my report of the work and condition of the Agricultural Department for the two years ending Sept. 30, 1882.

INSTRUCTION.

I have taught the Freshman classes practical agriculture during the spring terms. Such topics as drainage, history of breeds of horses, cattle, sheep, and swine, their characteristics and adaptation to particular purposes, have received attention. The classes have had practical illustrations, having spent some time each term in comparing animals in the barn-yard and judging them by a scale of points. The instruction has been mostly given in the form of familiar lectures or talks. The students have been interested and attentive to the discussion of these topics, and with few exceptions have passed good examinations at the close of the terms.

I have also lectured to the Senior classes, the last term of the Senior year, on the following topics: History of agriculture, farm economy, principles of stock breeding, mixed husbandry, rotation of crops, management and application of manures, care of farm premises, farm implements, farm accounts, selling of farm products, agricultural law and literature. On account of severe illness I was unable to meet the class the last week of the term ending Aug. 15, 1882, and the members were passed in agriculture without examination, by vote of the faculty. I am pleased to express my appreciation of the excellent order and gentlemanly deportment of the students whom I have had in charge in the class-room and at their labor on the farm. I have taken my regular turn in the lectures to students in the chapel on Wednesday afternoons, and have discussed the following subjects: Ideals and their Realization, The Relation of the Educated Farmer to the Community and the State, The Labor System of the Michigan Agricultural College. I have also attended the farmers' institutes held in the State during the winters of 1881 and 1882, to which I was assigned by the Board of Agriculture, lecturing on Mixed Husbandry and Wheat Growing, Farm Economy, Silos and Ensilage. I have attended the annual meetings of the various State agricultural associations, and by invitation the annual institutes of the Kalamazoo county farmers' club, one of the strongest and most lively farmers' organizations in the State.

TEACHERS OF AGRICULTURE.

The annual meeting of the organization known as "The Teachers of Agriculture," was held at this College in June, 1881. The following gentlemen, teachers of agriculture in the colleges of the States named, were present: Profs. Knapp and Budd, Iowa; Thompson of Nebraska, Henry of Wisconsin, Morrow of Illinois, Townsend of Ohio, Porter of Minnesota, Shelton of Kansas, Tracy of Missouri, and Georgeson of Texas. This meeting (the first since the organization at Champaign, Ill., the year before, where we met by invitation of Prof. Morrow) was pleasant and profitable. The objects of this association are to bring workers in the same field together, not so much to read carefully prepared essays as to become acquainted and to discuss, in an informal way, the practical subjects connected with our work as teachers of agriculture, and especially to note the practical management of the farms and departments at the different institutions with which we are connected. This year I attended the meeting which was held at the Iowa Agricultural College. This College seems to be doing an admirable work in all of its departments. Under the practical management of Prof. Knapp, the agricultural department is being developed and managed in such a way as to secure the hearty coöperation and support of the best farmers of this great agricultural State. The Iowa meeting was a success. We meet next year at Columbus, Ohio.

PERMANENT IMPROVEMENTS ON FARM.

The need of a grain barn and tool house were so apparent, that when estimates were presented to the Board two years ago, when deciding what appropriations to ask for new buildings, these were included, and thanks to the Legislature of 1881, the farm department was supplied, not only with a sum supposed to be sufficient to erect these, but also to make special experiments with ensilage and its feeding value. A grain barn 45x80 feet, with 24 feet posts, with basement story on a good stone wall, and so arranged that in threshing the straw may all be secured in the barn, has been erected. A silo 14x15 feet was placed in the basement, which is described at length in the ensilage reports.

The tool-house located west of the sheep house is 40x90 feet—two stories—giving us ample accommodations for all of our farm implements. Good materials have been used in the construction of these buildings, they have been finished with two coats of paint, and while no effort has been made in the way of ornament, we trust both will prove to be substantial and suited to the purposes for which they were designed.

On account of the lateness of the season when I was apprised that I was to supervise the construction of these buildings, and the great advance in prices of materials and labor between the time of placing the estimates and the erection of the buildings, I was unable to complete the tool-house within the appropriation. The building account will show the deficit, which has been met from current expense.

The rail fences from the barns to the river, on both sides of the lane, have been replaced by one of posts and boards. Maple and elm trees have been planted on each side of the lane as far south as field No. 12. The trees have made a good start during the summer, and future collegians will enjoy the shaded avenue and appreciate the work of the Sophomores of '82, who attended to the planting. We are under obligations to Prof. Beal, who furnished the trees from the College arboretum.

Field No. 7 has been almost cleared of stumps, and a good deal of labor has been expended in Nos. 12 and 13 in clearing and burning, as well as in No. 16. The unsightly piles of stones in the fence corners of most of the fields, have been removed and used in making a foundation for the extension of the lane and road through No. 12, which we hope to have completed this fall. The fences have been repaired, and with few exceptions the fields are well enclosed with good rail fences staked and wired. The herdsman's house has received needed repairs. A well has been put down at the farm house at an expense of $140.00, and unless some grave mishap occurs, the cost of repairs of buildings for the next two years will be small. An estimate has been made for the expense of repainting the buildings of the department.

DRAINAGE.

The eight-inch sewer has been completed to No. 12, through Nos. 8 and 10. A large part of the course of this drain was through quicksands, and the tile had to be laid at a depth from six to eight feet. It was a difficult job, but has been mainly accomplished by the labor of students. We thought it desirable to use glazed sewer pipe for this main, which is to conduct the drainage water from a large portion of Nos. 12 and 13 to the river, a distance of about 160 rods. The use of this pipe was more expensive than ordinary tile, but we are confident as to the durability and working of the drain as now laid. This work of drainage should still be continued, and a special appropriation will be needed for this purpose. We hope if means are furnished to place the larger portion of fields Nos. 12 and 13 in a condition to be occupied with cultivated crops during the next two years. Quite large portions of these fields are marshy and wet, and a large number of tile must be laid if these waste places are reclaimed and made tillable.

STOCK.

The policy to which I referred in my last report on this subject has been followed, viz.: to weed out and dispose of all inferior animals, and to improve the quality of the College herds. While we have not accomplished all we could desire, perhaps not all we ought to have done, because of errors of judgment, we believe a very decided improvement has been made.

By authorization of the Board of Agriculture I attended the sale of Judge Jones and Mr. C. Hills, of Delaware, Ohio, in October, '80, and purchased a bull and three Rose of Sharon cows. One of these was sold the following June. The reserved animals have proved valuable as breeders, and we have thus introduced one of the most desirable and popular families of Short Horns in the College herd. A Victoria Duchess, bred by J. R. Page, Esq., of Sennett, N. Y., was purchased of Mr. J. P. Sanborn, at the closing out sale of Avery & Murphy. She has given us two heifer calves, one of them by the Twenty-third Duke of Airdrie. In June last Hon. Franklin Wells, of the Board, and myself attended the series of Short Horn sales in Chicago and purchased three heifers; a young Mary, of the VanMeter family, an imported Harriet, and a Roan Duchess; also a bull bred by Winslow Bros., of Kankakee, Ills., sired by the pure Princess bull, 2d Duke of Northumberland—dam an imported Lady Acomb cow—one of the best of the Bell-Bates families of Snort Horns. The Third Grand Baron, 39163 A. H. B., has proved a valuable sire. His calves are very uniform in color, form, and markings, vigorous, rapid growers, and of excellent quality. The Peri Duchess has developed into a remarkably fine, even cow of medium size. We had the misfortune to lose her calf, by the Oxford bull Duke of Vinewood, a year ago. This year she has a beautiful heifer calf by the Third Grand Baron. The College

Peri heifer, by Duke of Vinewood, is doing well, and promises to make a good breeding cow. An imported Hereford cow, a prize taker wherever shown, was purchased of Messrs. Burleigh and Bodwell, of Vassalboro, Maine, a year ago. She has brought us a grand bull calf by imported Careful, which we have recently sold to Mr. J. M. Turner, of Lansing, one of the most successful breeders in central Michigan, for $300. The imported Holstein cow, "Mae," the first choice heifer of the Birney importation, and the first premium cow in her class at the State fair of 1881, was purchased of Mr. Edwin Phelps, of Pontiac, a year ago. She is a very fine representative of the breed.

Registered Merinos have been purchased from the flocks of Mr. A. D. Taylor and J. P. Thompson, of Romeo. The ewes secured from Mr. Taylor were all bred by Messrs. L. P. Clark and Bascom Bros., of Vermont, and of the purest Atwood blood. The ram bought of Mr. Thompson has developed into a good animal and has proved a valuable sire. A Southdown ram has been purchased of Mr. J. Lessiter, of Jersey, Berkshire swine of N. A. Clapp, of Novi, Poland China, of Barnes Bros., Byron, Mich. Mr. Geo. Stuart, of Grand Blanc, Mich., presented the department with a pair of Jersey Red swine a year ago. It will be seen that we have living specimens of the most prominent breeds of the domestic animals named. While by the decision of the Board we keep only *herds* of Short Horns and Ayrshires—we design to keep good individual animals, that shall fairly represent the distinctive qualities of each breed. This enables us to give our students the best facilities for illustration in stock husbandry.

The purchases made during the two years have greatly improved our herds and we have during this time sold fifteen well bred Short Horns, beside a large number weeded out and sold for the shambles.

It is gratifying to learn that the College is sending out animals that prove satisfactory to purchasers. Our herds now embrace different families and strains of the most approved blood, and we are able to offer good selections at reasonable prices. We aim to keep our breeding animals in good thriving condition to avoid the excessive feeding and high flesh, which has proved injurious to so many well bred cattle, and to combine, as far as we can, the qualities that render animals of practical value, milk and beef.

We made an exhibition from our herd of Short Horns at the State Fair at Jackson in September, 1881. Our animals were entered and shown in their respective classes, and premiums awarded as judges decided they merited. The College stock is not shown for cash premiums, only competing in the regular classes for the ribbons. We received first premium on Third Grand Baron 39163 A. H. B. in three-years-old class, two first and two second on females. The question is often raised, why do you not show the College stock every year? By decision of the Board, as I understand, the Chemical, Horticultural, and Farm Departments of the College take turns in exhibiting at the fairs. This will explain why the farm is represented only once in three years.

Our farm teams will soon need to be replaced by younger ones. Our horses have been good work animals, but selected without reference to their breeding. When a change is made would it not be well to place a pair of Percherons and a pair of Clydesdales, or high grades of these now popular breeds on the College farm?

ENUMERATION OF STOCK.

The inventory of September 30th, 1882, comprises animals of the different breeds as follows:

Short Horns, 37, embracing the pure Bates bull, Col. Acomb 2d, the Third Grand Baron, and females of the Peri Duchess, Rose of Sharon, Victoria Duchess, Hela's, Young Marys, Roan Duchess, Imported Harriets, and other reliable families. All of the Short Horns are recorded in the American Herd Book.

Ayrshires, 15, headed by the young bull Jacob, of Linden, No. 2600, Ayrshire record and bred by T. L. Cooper, of Coopersburg, Pennsylvania.

Jerseys, 3, Jersey Cattle Club Register; Galloways, 1; Herefords, 2, cow imported; Holstein, 1, cow imported; Devon, 1; cross bred animals, 3, making a total of 63 animals.

SHEEP.

Merinos, registered	22
" College bred	75
Southdowns	42
Cotswold	4
Total	143

SWINE.

Essex	63
Berkshire	6
Poland China	1
Jersey Reds	6
Total	76

HORSES.

Work horses	7

All of our cattle are weighed monthly. We have found it interesting and instructive to observe and compare the effects of similar food and care upon the different breeds, as shown by the frequent weighings. I append a portion of this record, thinking it may prove of some interest to stock growers; also a summary of milk record for year ending January 1st, 1882.

TABLE OF MONTHLY WEIGHINGS OF CATTLE ARRANGED BY BREEDS FOR 1881, 1882.

	When Calved.	October 26.	November 26.	December 26.	January 26.	February 26.	March 26.	April 26.	May 26.	June 26.	July 26.	August 26.	September 26.
SHORT HORNS.													
3d Lord Baron	1878	2116	2120	2163	2270	2240	2255	2245	2250	2330	2180	2210	2240
Cows.													
Heroine	1876	1150	1200	1190	1306	1270	1287	*1110	1090	1120	1172	1140	1170
Heroine 2d	1877	1190	1275	1236	1320	1277	*1135	1110	1154	1160	1230	1222	1222
Hela	1873	1400	1470	1432	1552	1500	1510	*1385	1358	1393	1430	1364	1423
Peri Duchess	1877	1290	1385	1365	1460	*1373	1300	1290	1255	1290	1330	1234	1240
Bonny Red Rose 2d	1874	1485	1526	1565	1568	1640	1650	*1520	1530	1592	1650	1660	1584
Crystal Queen 9th	1876	1390	1500	1558	1596	1650	*1436	1522	1480	1504	1520	1410	1460
Hermia 2d	1878	1220	1260	1230	1250	1270	1258	1270	1276	1330	1390	1384	1415
College Peri Duchess	1880	868	935	1055	1147	1164	1230	1245	1226	1174	1200	1200	1182
Handsome Hela 2d	1880	760	834	788	800	760	826	910	924	974	1060	1054	1107
Victoria Duchess 4th	1875	1369	13 8	1280	1270	1246	1353	1410	*1300	1350	1376	1360	1352
College Red Rose	1881	516	590	646	715	774	840	862	890	916	927	928	933
Heroine 4th	1881	374	428	490	568	615	684	752	730	768	803	820	837
Handsome Hela 3d	1881	392	440	480	533	570	640	650	680	692	702	674	677
College Victoria Duchess	1881	305	375	423	490	535	596	628	655	693	706	722	750
Hela 4th	1880	790	830	818	938	884	897	960	990	1042	1080	1100	1120
AYRSHIRES.													
Jacob of Linden	1880	840	940	980	1043	1096	1140	1160	1160	1170	1221	1214	1195
Cows													
Mary Stewart	1871	1130	1048	1038	1112	1080	1106	*993	988	982	1020	986	1010
Susie Stewart	1874	1000	1054	1040	1108	1070	1092	*938	880	958	993	980	942
Stewart Queen	1878	980	1040	1000	1057	1000	1037	1058	1094	1117	1165	1157	1152
Lady Philly	1878	970	1096	975	1065	1030	1054	1070	1010	992	928	955	978
Lulu of Lansing	1878	920	945	893	1008	930	986	1010	1010	1038	1049	1022	1040
Philletta	1879	780	824	813	860	843	880	900	950	970	1024	1019	1045
Ayrshire steer Scott	1880	622	695	724	800	790	826	842	862	883	978	986	1000
GALLOWAYS													
Snow Flake	1877	1130	1200	1175	1288	1250	1250	*1144	1100	1152	1170	1116	1110
" " 2d, Cross-bred, S H, & G.	1881	586	650	715	752	812	882	882	925	944	940	942	955
" " 3d. " "	1882	----	----	----	----	------	------	------	------	246	294	360	400
JERSEYS.													
Idyl of Cedar Vale	1871	990	1004	1010	1063	997	1050	*950	973	1002	1056	1020	1028
HERKFORDS.													
Cow.													
Lemon	1876	1540	1570	1600	1620	1600	1630	1638	*1565	1530	1466	1443	1438
HOLSTEINS.													
Cow.													
Mae	1875	1103	1130	1110	1117	1122	1136	1162	1176	1188	1188	1185	1218
DEVONS.													
Steer.													
Batavia 2d	1880	710	758	768	814	751	748	800	847	886	940	965	1000

The * indicates that cow had calved during month.

SUMMARY OF MILK RECORD FOR YEAR ENDING JANUARY 1ST, 1882.

Name.	Age.	Breed.	Date of Calving.	Weight of milk for 1881—No. of pounds.
Hela 3d	3	Short Horn.	Jan. 1st, 1881.	3,915
Heroine	5	" "	Mar. 5th, 1881.	6,801¼
Heroine 2d	4	" "	April 3d, 1881.	5,583½
Peri	4	" "	Mar. 29th, 1881.	2,732
Phœnix	4	" "	Dec. 8th, 1880.	5,556
Lady Philly	3	Ayrshire.	Jan. 2d, 1881.	3,984½
Phile	5	"	Feb. 14th, 1881.	4,127
Phillacy	6	"	Mar. 3d, 1881.	4,184
Stewart Mary	10	"	Feb. 25th, 1881.	4,732
Stewart Susie	7	"	April 12th, 1881.	4,049
Idyl of Cedar Vale	10	Jersey.	April 28th, 1881.	5,076
*Mae	4	Holstein.	Last calf June, 1881.	7,607

* Mae's record is from October 1st, 1881, to October 1st, 1882.

EXPERIMENTS.

In addition to the work of instruction and superintending the farm, some time and labor have been devoted to farm experiments, some report of which is herewith appended. There is a great demand for experiments at the College; but it must be remembered that work of this character, with our present system, can only be incidental, secondary to the regular work of instruction and the superintending of departments. We have to teach and have charge of departments where there is much of detail. These duties give at best only limited time, and that irregularly, for experimental work.

The results of our ensilage experiments are given in the following report:

At the last regular session of the Legislature an appropriation was made of one thousand dollars "for the purpose of conducting experiments with ensilage for the feeding of animals, the culture of amber cane and new varieties of grain and beet roots by the farm department of the Agricultural College." The bill was not passed until quite late in the session, being approved June 11, 1881, so that we were somewhat hurried in the preliminary work of preparing the ground and building the silo. As a new grain barn, with high basement walls, was being erected on the farm, we decided to build the silo in one corner of this basement, with the thought that if the ensilage experiment was not satisfactory, the silo could be utilized as a root cellar. A space in the northeast corner was chosen for this purpose, and a wall made eighteen inches thick, well laid with common field stone and strong mortar. Tiles were laid to carry off water and the floor was then covered with small stones, bedded in cement, and then cemented, as well as the sides, until all was smooth, and supposed to be air and water tight. The inside measurement of the silo is 14x15 feet, and walls 8 feet high. There is a door four feet wide and six feet high from the silo into the basement, where the ensilage is taken out. From the wall on two sides a frame four feet high extends, sided with matched stuff and covered with a tight floor—the barn forming the other two sides. Two doors from the barn floor, 3x4, open into this upper space, where the ensilage is run from the cutter into the silo, and a door of the same size is on the outside for putting in and taking out the stones used for weighting the ensilage. This frame extension from the walls gives space for the weights and allows us to fill the silo to nearly its full capacity after the pressure has been applied. Where circumstances will admit, I think the barn basement is the proper place for the silo. It is near the stables, where it is to be used, and a door through which it may be taken out, directly to the animals, is more convenient than to lift the ensilage over the top of the wall. Silos can be built in almost any barn in this manner at much less expense than if built separately, as no extra expense for roof is incurred. When filling the silo, matched plank were fitted in the doorway to the basement, and the ensilage packed against these as the filling proceeded. When opened the ensilage was found to be as perfectly preserved next to these plank as in any other part of the outside of the silo. Matched plank, two inches thick, were used as a cover, care being taken to have them fit closely, but not to bind in the settling.

The items of expense incurred in building the silo are as follows:

Excavation	$10 00
Fifty-six perch of stone, at 75 cents a perch	42 00
Laying stone, at 60 cents a perch	33 60
Ten barrels lime, at $1.10	11 00

Sand	$3 40
Four barrels cement, at $1.45	5 80
Grouting bottom, cementing sides, etc	10 00
Doors and frames above	30 00
Plank for covering silo	6 00
	$151 80

CORN-FODDER GROWN FOR ENSILAGE.

The land upon which the fodder corn grew is a sandy loam—sand predominating. It had grown a corn crop the previous year, and was clean, but not sufficiently fertilized to produce a large crop. It was put in good condition to receive the seed, and drills marked three and one-half feet apart. June 11th the plat of 1⅞ acres was planted with the Hathaway dent corn—the variety grown upon the farm for some years. Corn was dropped in the drills and covered by hand, at the rate of one and a half bushels to the acre. I think less seed would have given a larger yield as it was too thick to make a large growth. The corn came up well and grew very rapidly, receiving three cultivations, and being kept free from weeds. In August the severe drouth began to tell upon its growth—the leaves and some of the stalks turning yellow, occasioned by the dry weather and the crowded state of the plants. But few ears formed. I quote from our field notes: July 21st—The ensilage corn is rolling considerably. July 28th—The ensilage corn has been at a stand-still for a week, on account of the extreme dry weather. August 8th—The ensilage corn has been shortened a good deal by the dry weather. August 18th—Continued rains. The ensilage corn, though cut short, seems to be making some growth at present. August 26th—The ensilage corn is again nearly at a stand-still, owing to the dry weather. That the dry weather shortened the crop was plainly evident.

FILLING THE SILO.

We began cutting the corn and filling the silo on Monday, Sept. 13th. The most of the stalks were green and full of juice at this time. On some parts of the plot some stalks were browned and the lower leaves dried, but to no great extent. A two-horse tread-power and our ordinary stalk-cutter, made at Fulton, N. Y., were used. A one-horse cart, and a double team and wagon drew the corn to the silo, which was only a few rods distant. The work was mainly done by students, who only work three hours in the afternoon, and so no full day's work was performed. On Wednesday, the 15th, it rained, and the cut fodder was somewhat wet, and some corn was cut while the water was dripping from it. On Thursday, the 16th, we finished the cutting. The corn, cut in pieces about one-half inch in length, was run directly to the silo, where it was spread and tramped down as compactly as possible. Nothing was mixed with the fodder, and no other crop but corn was put in the silo. We cut at the rate of two tons an hour, I think, and we found the tread-power to answer a very good purpose. With a large machine more power would be needed, but twenty tons a day works it up quite as rapidly as most farmers will desire. Farmers will, I think, find any good power cutter will do as well, perhaps, as some of the more recently patented machines known as ensilage cutters. The stalks were not weighed when put in, but we have weighed the ensilage as it was taken from the silo, and it weighs out 40,000 pounds, in round numbers, or between ten and eleven tons to the acre. This yield is a very fair one, when the condition of the land and the season are taken into the account; but I have no doubt that it might be trebled, perhaps more, under the most favorable conditions.

COVERING THE SILO.

The ensilage having been carefully leveled, so that the pressure should be equal, the planks, two inches thick and eight inches wide, were nicely fitted as the covering proceeded, care being taken that there should be no danger of binding at the ends, as the settling continued. It was then weighted immediately with stones, at the rate of nine hundred pounds to the square yard.

Various means for securing the desired pressure for the ensilage have been suggested, but it seems quite probable that weights of stone, wood, bags of grain, or boxes of earth will be found after all most desirable, as such pressure is constant and needs no watching, while a screw-power, neglected or forgotten, will be quite likely to result in failure. The labor of putting on the stones and taking them off is no great item in the account. The stones we used had to be drawn a short distance, and three boys with a one-horse cart weighted the silo in four hours.

COST OF RAISING CORN AND PUTTING SAME IN SILO.

Plowing and harrowing 1¾ acres	$3 00
Marking and planting	2 74
Three bushels seed, at $1.00	3 00
Cultivating three times	2 50
300 hours student labor, at 8 cents	24 00
37½ hours team labor, at 1 shilling	4 69
15 hours men's labor, at 1 shilling	1 88
	$41 81

This makes the entire cost of growing corn and placing in silo $2.09 per ton. This amount also includes the time of getting the horse-power from a neighboring farm and returning the same, and some allowance must be made for delays that were unavoidable in work with which none of us were familiar.

There was no outward sign of any change going on within the silo. Only a temporary roof was over it for some time, and on one or two occasions it was left in such shape as to receive some rain. On December 15th the silo was opened. The ensilage was found to be nicely preserved. There was no mould next to the plank or sides worth mentioning, and there has not been one per cent of waste.

The thorough exclusion of the air is the secret of its preservation. It matters but little what materials are used for the silo—lumber, stone, or merely pits—if the air is only excluded the fodder will be preserved. Many farmers at the institutes during the winter have inquired, "How do you get the ensilage from the silo?" and so I refer to it here. The stones were thrown back from five of the plank next the basement door, the plank removed, and this section was cut down with a hay-knife and taken out with a four-tined fork and placed in baskets to be taken to the stable. After this section had been disposed of the process was repeated, only taking off the cover as needed (another advantage in weighting in this way). The process is similar to cutting down a hay-mow.

Not one of the least important considerations of ensilage is the fact that so large an amount of it can be packed in a comparatively small space. A cubic foot of ensilage from our silo will weigh 35 pounds. From 5 to 6 per cent of the live weight of the animal will be a daily ration, or from 50 to 75 pounds for an ordinary cow. It is thus an easy matter to compute the number of cubic feet necessary to contain the food for a certain number of animals. The silo at the College is 14x15 feet inside the walls, and 8 feet high, containing 1,680 cubic feet. Allowing 40 pounds to the cubic foot and we have a capacity for almost 39 tons of ensilage, or enough to feed five cows for 200 days a daily ration of 60 pounds each. When we take into the account the large weights that can be packed in a small silo it seems that this promises to be the most economical method of providing shelter for fodder—no small item to farmers who are not well supplied with buildings.

The ensilage was slightly acid in taste, quite brown in color when first taken from the silo, but, after exposure to the air a short time, regained largely its fresh, green appearance. The cattle, from the start, with a few exceptions, ate it with avidity.

An analysis, made at the New Jersey Experimental Station by Prof. Neale, is herewith given:

Loss at 100° C	82.27
Protein	1.63
Fat	.76
Fiber	4.72
Ash	1.94
Carbhydrates	8.68
	100.00

The analysis will be found, with several others, in the report of Prof. Cook, director of the New Jersey Experimental Station, to which I refer elsewhere. I have thus inserted it for the purpose of comparison. It will be seen that it was an average sample. Our sample contains more protein or nitrogenous elements than either of the others, but falls a good way below the first four in the per cent of carbhydrates. As the albuminoids are the most expensive ingredients to produce, this sample would take average rank in feeding value.

We began our feeding experiment Dec. 1st, feeding to the 15th in a preliminary way, when we began to feed ensilage.

The following notes and table will, it is hoped, give some definite idea of the object in view and the results reached.

FEEDING ENSILAGE.

Object of the Experiment.

The aim of the experiment was to determine the comparative value of ensilage, as a cattle food, for the production of milk, flesh, and growth.

With this aim in view, the ensilage was fed in place of roots, and as a full or partial substitute for the dry, rough feeds. A reference to the accompanying table will show the different proportions and combinations in which the ensilage was fed.

Animals Chosen for the Experiment.

Four lots of cattle were selected from the college herd Dec. 1, 1881.

Lot I consisted of two milch cows, Ayrshire and Shorthorn, that had dropped first calves early in September of the same year.

Lot II was composed of two steers, Devon and Ayrshire, of nearly the same age and weight. The Devon was in rather better flesh than the other.

Lot III had two large, dry cows, Shorthorns, very nearly alike as to weight, time of calving, condition of flesh, and feeding qualities.

Lot IV was made up of three bull calves, all Shorthorns, which were very even as to weight, condition of flesh, and age.

Previous Treatment of the Animals.

Owing to the late growth of grass and the mild fall weather, the cows and steers had been turned out to pasture during the day and stabled only at night. They had been fed dry cut cornstalks once and meal twice daily. The three bull calves had been kept in stalls for a month previous to the experiment, and had received a good hay and meal ration.

During the month of November all the animals selected for the experiment had lost weight, except the bull calf "No. 9" of the table, and he had gained nothing.

Nos. 3, 5, and 6 of the table were in good flesh—not fat—and the rest were in thrifty condition, though in rather thin flesh.

Treatment During the Experiment.

During the experiment all the animals were fed regularly three times daily at 6:30 A. M., noon, and 5 P. M. They were watered in the stall at 8 A. M., and again just before feeding at night. The milking was done just before the regular morning and evening feedings.

The animals were well groomed daily with card and brush. Every day, from 10 A. M. till noon, the cattle were turned into yards sheltered on the north and west. While in the yard they again had access to water. At this time also, each day, the stalls were well cleaned and littered. The cattle were salted twice each week. They were weighed on putting up, and regularly each week thereafter at 4 P. M.

The cattle were attended throughout the experiment by one man, and especial pains were taken to secure regularity and uniformity in everything pertaining to the feed and care of the animals.

Feed and Feeding Notes.

The rough feed was all cut into one-fourth to one-half inch lengths by a power cutter. The cornstalks were not very good, owing to bad weather while curing. The hay (timothy and clover, one-half each) and oat straw were of first quality. The meal, fed to the cows and steers, had 14 parts corn meal, 4 parts oat meal, and 9 parts wheat bran, by weight. That fed to the bull calves, and also to the Ayrshire steer, during the last six weeks of the experiment, was composed of one-third oat meal, one-third oil meal, and one-third wheat bran, by weight.

Exact notes of the feed given to each animal were kept, and any feed left in the mangers was also carefully noted and removed before the next feeding.

Contents of the Table.

The table contains a concise description of each animal, and gives the ingredients and exact proportions of the average daily rations. It also presents a full showing, by fortnights, of the feed consumed, gains in weight and the milk yield.

In the column headed "Total Feed Consumed," the decimals are omitted, but the calculations based on this column were made with the *exact* numbers.

The losses in weight were put into the column marked "Gain in Weight," but the minus sign was prefixed in every case, thus (– 36).

The two columns headed "Gain per Cent" were calculated as follows: The "gain per cent of live weight" was obtained by dividing the "gain in weight," each fortnight, by the weight of the animal at the beginning of the same fortnight. The "gain per cent of feed consumed" was obtained by dividing the "gain in weight," each period, by the "total feed consumed" in the corresponding period. In the fifth fortnight there was a slight gain in the milk yield of both cows. This is indicated in the column marked "pounds shrinkage" by the word "gain" over the proper number.

TABLE *Showing by Fortnights the Results of the Feeding Experiment.*

DESCRIPTION OF ANIMALS.				FEED RECORD.								WEIGHTS AND GAINS.					MILK YIELD.		
				AVERAGE DAILY RATION.															
No. of Lot.	No. of Animal.	NAME, BREED, SEX, AGE, ETC., OF ANIMALS.	No. of Fortnight.	Meal.	Cut Hay.	Cut Corn Stalks.	Cut Oat Straw.	Sliced Rutabagas.	Ensilage.	Full Ration.	Total Feed Consumed.	Weight at Beginning of Fortnight.	Weight at End of Fortnight.	Gain in Weight.	Gain per cent of Live Weight.	Gain per cent of Feed Consumed.	Total No. of Pounds.	No. of Pounds Shrinkage.	Daily Average.
LOT I.	1	Lulu of Lansing. Ayrshire milch cow. Age 3 yrs. Dropped first calf Sept. 2, 1881.	1	7.	-----	30.	-----	15	-----	52.	728	926	952	26	2.8	3.6	228 5	9.5	16.32
			2	7.	-----	-----	-----	----	49.	56.	784	952	916	-36	----	---	218 5	10.	15.61
			3	7.	-----	-----	-----	----	50.	57.	798	916	930	14	1.5	1.8	206.5	12.	14.75
			4	7.	-----	-----	-----	----	65.	72.	1008	930	957	27	2.9	2.7	192.	14.5	13.71
			5	7.	-----	-----	-----	----	65.7	72.5	1015	957	960	3	.3	.3	201.	*9.	14.36
			6	7.	-----	-----	-----	----	63.7	70.7	990	960	976	16	1.7	1.6	191.	10.	13.64
	2	Hermia 2d. Shorthorn milch cow. Age 3 5-12 years. Dropped first calf Sept. 3, 1881.	1	7.	-----	32.	-----	15	-----	52.	728	1234	1212	-22	----	----	193.	1.	13.79
			2	7.	-----	-----	-----	----	59.	66.	924	1212	1185	-27	----	----	188.	5.	13.43
			3	7.	-----	-----	-----	----	60.	67.	938	1185	1236	51	4.3	5.4	172.5	15.5	12.32
			4	7.	-----	-----	-----	----	66.5	73.5	1029	1236	1244	8	.6	.8	164.5	8.	11.75
			5	7.	-----	----	-----	----	62.	69.	966	1244	1268	24	1.9	2.5	172.	*7.5	11.29
			6	7.	-----	-----	-----	----	62.	69.	966	1268	1264	-4	----	----	166.	6.	11.86
LOT II.	3	Batavia 2d. Devon steer. Age 1⅔ years.	1	5.	5.75	9.	-----	----	-----	19.75	277	740	710	-30	----	----			
			2	4.5	6.5	-----	-----	----	21.5	32.5	455	710	760	50	7.	11.			
			3	5.	7.5	-----	-----	----	26.21	38.71	542	760	778	18	2.4	3.3			
			4	----	-----	-----	-----	----	36.25	36.25	508	778	776	-2	----	----			
			5	----	-----	-----	-----	----	41.82	41.82	585	776	760	-16	----	----			
			6	----	-----	-----	-----	----	39.25	39.25	550	760	746	-14	----	----			
	4	Scott. Ayrshire steer. Age 1½ years.	1	5.	5.75	9.	-----	----	-- --	19 75	277	680	700	20	2.9	7.2			
			2	4.5	6.25	-----	-----	----	19.	29.75	417	700	736	36	5.1	8.6			
			3	5.	7.21	-----	-----	----	23.14	35.39	495	736	756	20	2.7	4.			
			4	3.	-----	-----	-----	----	37.29	40.29	564	756	767	11	1.5	1.9			
			5	3.	-----	-----	-----	----	44.82	47.82	669	767	774	7	.9	1.			
			6	3.	-----	-----	-----	----	44.43	47.82	669	774	780	6	.8	.9			
LOT III.	5	Bonny Red Rose 2d. Shorthorn dry cow. Age 7 1-12 years. 4 months with calf.	1	3.5	7.5	11.5	9 5	15	-----	47.	658	1516	1530	14	.9	2.1			
			2	3.25	6.25	9.5	8.5	----	15.	42.5	595	1530	1552	22	1.4	3.6			
			3	3.5	7.5	8.86	8.92	----	15.	43.78	613	1552	1570	18	1.2	2.9			
			4	3.5	-----	-----	----	----	73.43	76.93	1077	1570	1594	24	1.5	2.2			
			5	3.5	-----	-----	-----	----	84 18	87.68	1228	1594	1630	36	2.3	2.9			
			6	3.5	-----	-----	-----	----	78.50	82.	1148	1630	1636	6	.4	.5			
	6	Crystal Queen 9th. Shorthorn dry cow. Age 5 5-12 years. 5 months with calf.	1	3.5	7.5	10.5	11 5	15	-----	48.	462	1492	1530	38	2.5	8.2			
			2	3.25	6.25	9.5	10.	----	13.5	42 5	595	1530	1536	6	.4	1.			
			3	3.5	7.5	8.42	9.28	----	15.	43.7	612	1536	1594	58	3.8	9 5			
			4	3.5	27.75	----	-----	----	-----	31.25	438	1594	1605	11	.7	2.5			
			5	3.5	24.78	-----	-----	----	-----	28.28	396	1605	1630	25	1.6	6.3			
			6	3.5	23.25	-----	-----	----	-----	26.75	375	1630	1646	16	1.	4.3			
LOT IV.	7	Helianthus. Shorthorn bull calf. Age 1 year.	1	5.5	12 5	-----	-----	13	-----	31.	434	598	650	52	8.7	12.			
			2	5.63	6.38	-----	-----	----	23.	35 01	490	650	678	23	4.3	5.7			
			3	5.28	6.78	-----	-----	----	27.57	39.63	555	678	726	48	7.1	8.7			
			4	5.	6.5	-----	-----	----	29.42	40.92	573	726	758	32	4.4	5.6			
			5	5.	6.39	-----	-----	----	29.96	41.35	579	758	802	44	5 8	7.6			
			6	5.79	7.29	-----	-----	----	30.	43.08	603	802	848	46	5.7	7.6			
	8	Horatio. Shorth'n bull calf. Age 11-12 years.	1	5.5	9.	-----	-----	14.5	-----	29.	406	508	540	32	6.3	7.9			
			2	5.63	5.	-----	-----	----	24.50	35.13	493	540	568	28	5.2	5.7			
			3	6.	3.78	-----	-----	----	27.50	37.28	522	568	616	48	8.5	9.2			
			4	6.	3.82	-----	-----	----	28 92	38.74	542	616	650	34	5.5	6.3			
			5	6.	4.79	-----	-----	----	29.82	40.61	569	650	688	38	5 8	6.7			
			6	6.	5.36	-----	-----	----	29.79	41.15	576	688	720	32	4 7	5.6			
	9	Hamlet. Shorth'n bull calf. Age 9-12 years.	1	5.5	8.13	-----	-----	14.5	-----	28.13	394	490	528	38	7.8	9.6			
			2	5.63	4.	-----	-----	----	24.50	34.13	478	528	560	32	6 1	6.7			
			3	6.	3.5	-----	-----	----	27.35	36.85	516	560	606	40	7.1	7.8			
			4	6.	3.32	-----	-----	----	29.50	38.82	543	600	631	31	5.2	5.7			
			5	6.	3.46	-----	-----	----	29.75	39.21	549	631	676	45	7.1	8.2			
			6	6.	4.39	-----	-----	----	29.82	40.21	563	676	708	32	4.7	5.7			

* Gain.

Comparisons Based on the Table.

1. *By Lots:*

LOT I.

During the first fortnight this lot had a daily ration of 14 pounds meal, 62 pounds dry cornstalks, and 30 pounds roots—a full ration. During the second and third fortnights, the daily ration was 14 pounds meal as before, and 109 pounds ensilage—a full ration during the second fortnight, but the cows would have eaten more ensilage during the third, had it been given them. During the fourth, fifth, and sixth fortnights the daily ration was again 14 pounds meal, and 129 pounds ensilage—a full ration.

Here are the results:

PERIODS COMPARED.	Average gain in weight per fortnight.	Average Milk yield per fortnight.	Daily average yield of Milk.
	lbs.	lbs.	lbs.
First fortnight	4.	421.50	30.107
Second, and third fortnight	1.	392.75	28.054
Fourth, fifth, and sixth fortnight	24.66	362.17	25.869

Although the 92 pounds of roots and fodder had been entirely substituted by 109 pounds ensilage,—little more than pound for pound,—the returns of the second and third fortnights are little below the first; and when the ensilage is increased during the next three fortnights to 129 pounds,—less than 1½ pounds ensilage to one pound of fodder and roots,—the results are considerably better than during the first period. Of course, in interpreting the results of the above feeding, the natural shrinkage in milk yield must be taken into account. That the above shrinkages are not great, the following comparison will clearly show. Stewart Queen,—the only other cow that became fresh at the same time of year,—dropped her first calf Aug. 28, 1881. This cow had all the dry cut cornstalks she would eat, a little hay occasionally, a meal ration, richer but a little lighter than that of Lot I, and, during February, a peck of roots daily.

Here are the figures:

ANIMALS COMPARED.	Weight Dec. 1st, 1881.	Weight Feb. 23, 1882.	Gain in Weight.	Loss in Weight.	Daily Average Dec. 1-15.	Daily Average Feb. 1-23.	Per Cent of Shrinkage.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Stewart Queen	1,040	1,000	....	40	9.71	8.15	16.07
Lot I—average of two cows	1,080	1,120	40	....	15.05	12.67	15.81

Stewart Queen is 3½ years old, and Nos. 1 and 2 of Lot I, 3 and 3 5-12 years respectively. It will be seen at once, from the above figures, that the cows in Lot I not only gave, on the average, about 5 pounds more milk daily apiece, but their per cent of shrinkage is *less* than that of Stewart Queen. Nor is this all; for the cows of Lot I gain 40 pounds in weight apiece, while the other cow *loses* 40 pounds. A reference to the table will show, too, that the gain in weight of this lot was almost wholly upon the meal and ensilage ration.

LOT II.

The effect of ensilage in the mixed ration of this lot is very marked. For the sake of perspicuity the feed and returns are given side by side.

PERIOD.	FEED CONSUMED DAILY.	Gain in Weight per fortnight.	Loss in Weight per fortnight.
First fortnight	Meal, 10 lbs.; hay, 11½ lbs.; cornstalks, 18 lbs.	......	10 lbs.
Second and third fortnights—average	Meal, 9½ lbs.; hay, 13 7-10 lbs.; ensilage, 44 9-10 lbs.	62 lbs.	......

The ration of this lot was a full one during all the time covered by the above comparison; that is, the animals had all the rough feed they would eat.

LOT III.

This lot, of two dry cows, had 7 pounds meal, 15 pounds hay, 22 pounds cornstalks, 21 pounds oat straw, and 30 pounds roots, daily, for the first two weeks. The gain in weight during this time was 52 pounds.

During the second and third fortnights, the daily ration of this lot was 6¾ pounds meal, 13¾ pounds hay, 18¼ pounds each of cornstalks and oat straw, and 30 pounds ensilage. In other words the ensilage was substituted for roots, pound for pound, while the dry feed ingredients of the ration were cut down a little, to get the cows to eat the full allowance of ensilage. Again, the gain in weight was 52 pounds each fortnight. This lot and also Lot II were divided at the end of third fortnight. They will be noticed again.

LOT IV.

This lot, consisting of three bull calves, received daily during the first fortnight, 16½ pounds meal, 29½ pounds hay, and 42 pounds roots. During the second, third, and fourth fortnights, the average daily ration of the lot was 17 pounds meal, 14¼ pounds hay, and 80¾ pounds ensilage. For the fifth and sixth fortnights, the calves consumed daily, on the average, 17½ pounds meal, 15¾ pounds hay, and 89½ pounds ensilage. The gains of the lot for the different periods are here given:

First fortnight, gain in weight	122	pounds.
Second, third, and fourth fortnights, average gain in weight per fortnight	107	"
Fifth and sixth fortnights, average gain in weight per fortnight	118.5	"

The comparison seems to be unfavorable to ensilage; but before drawing any conclusions let us review the facts. At the end of the first fortnight, ensilage was made to take the place of the roots pound for pound, and also of 15 pounds of the hay, three pounds for one. The 90 pounds of ensilage had in the 15 pounds hay and 45 pounds roots, a strong competitor, to say the least. The calves could not take this allowance of ensilage, as the table clearly shows. Yet, during the last two fortnights, on *nearly* the full feed of ensilage, the gains approach very closely to that of the first period.

2. *By Individuals:*

As Lots II and III were divided at the end of the third fortnight, the following comparisons are of single animals, and cover the whole time of the experiment. Each animal is referred to by the number given in the table, and the daily rations and returns are brought together.

NO. 3.

Time fed.	DAILY RATION.	Returns per fortnight.
2 weeks	Meal, 5 lbs.; hay, 5¾ lbs.; cornstalks, 9 lbs.	loses 30 lbs.
4 weeks	Meal, 4¾ lbs.; hay, 7 lbs.; ensilage, 23¾ lbs.	gains 34 lbs.
6 weeks	Ensilage, 39 lbs.	loses 10⅔ lbs.

The superiority of ensilage over cornstalks as an ingredient in a mixed ration is marked. The loss on the 39 pounds of ensilage—all the steer would eat—is also significant.

NO. 4.

Time fed.	DAILY RATION.	Gains per fortnight
2 weeks	Meal, 5 lbs.; hay, 5¾ lbs.; cornstalks, 9 lbs.	20 lbs.
4 weeks	Meal, 4¾ lbs.; hay, 6¾ lbs.; ensilage, 21 lbs.	28 lbs.
6 weeks	Meal, 3 lbs.; ensilage, 42 1-5 lbs.	8 lbs.

Here the fluctuations are similar to those of No. 3, though not nearly as marked. During the last 4 weeks of the experiment, this steer would have eaten more ensilage had the allowance been increased. It is worth while to note that, *with three pounds of meal added,* No. 4, though not so hearty a feeder as No. 3, could eat 42 pounds of ensilage, while No. 3, on ensilage *alone,* ate only 39 pounds.

NO. 5.

Time fed.	DAILY RATION.	Gains per fortnight.
2 weeks	Meal, 3½ lbs.; hay, 7½ lbs.; cornstalks, 11½ lbs,; oat straw, 9½ lbs.; roots, 15 lbs.	14 lbs.
4 weeks	Meal, 3⅜ lbs.; hay, 7 lbs.; cornstalks, 9 1-5 lbs.; oat straw, 8¾ lbs.; ensilage, 15 lbs.	20 lbs.
6 weeks	Meal, 3½ lbs.; ensilage, 78¾ lbs.	22 lbs.

The above is a strong showing for ensilage, especially as compared with roots.

NO. 6.

Time fed.	DAILY RATION.	Gain per fortnight.
2 weeks	Meal, 3½ lbs.; hay, 7½ lbs.; cornstalks, 10½ lbs.; oat straw, 11½ lbs.; roots, 15 lbs.	38 lbs.
4 weeks	Meal, 3⅜ lbs.; hay, 7 lbs.; cornstalks, 9 lbs.; oat straw, 8¾ lbs.; ensilage, 14¼ lbs.	32 lbs.
6 weeks	Meal, 3½ lbs.; hay, 25¼ lbs.	17⅓ lbs.

This cow would not eat the full allowance of ensilage for several days, still her gain is a large one, though not equal to that of the first fortnight. During the next period, though getting all the good hay she would eat and the regular allowance of meal, the gain is less.

Condition of the Animals at the Close of the Experiment.

The cattle continued to eat with relish throughout the experiment. All the animals were sleek, lively, and apparently in excellent health when the experiment closed. Even the Devon steer, No. 3, that had been losing weight on an exclusive ensilage diet, began to gain at once, on a ration of ensilage and meal, showing that his constitution had not been injured.

Comparative Feeding and Cost Value of Ensilage.

The meal fed to the cows is worth $22.40 per ton. That fed to the bull calves, $25. Hay is worth $10, and cornstalks and oat straw each $5 per ton, and ruta bagas 40 cents per bushel.

Compared with the other feeds at the above rates, the ensilage has a feeding value four times the cost of growing the crop and putting it into the silo.

I was not at all sanguine, when we began the experiment, as to the decided merits of ensilage as claimed by many writers, but I have been greatly pleased with the results of the feeding. The convenience in handling the prepared fodder; the large amount that can be stored in a small space; the avidity with which cattle eat it and thrive and grow when a meal ration is fed with it; the fact that it can be stored in a wet time, during lowery weather, when fodder could not be cured; the furnishing of succulent food for stock during our long winters at very small cost,—these are some of the reasons that lead me to think the ensilaging of corn especially will prove to be a practical and profitable method of preparing food for stock. I think it may take the place of roots and be a cheap substitute for them. I am disposed to believe that the best results will be secured by feeding one daily ration of dry fodder in connection with the ensilage. The experiment shows that it is not a complete food ration. A meal ration adapted to the animal and the desired result must be fed with it. The winter has been exceptionally favorable for the feeding of fodder of this character, on account of its extreme mildness, the mean temperature having been about 28° during the time embraced in the feeding. With severe weather the results might be less favorable. On account of changes in his laboratory, and domestic afflictions, our chemist, Dr. R. C. Kedzie, was unable to make such chemical investigations during the feeding experiment as we had desired. A sample of ensilage from the College silo was therefore sent to Prof. George H. Cook, director of the New Jersey experimental station, with the request that it be analyzed. Prof. Cook had the analysis made very promptly, and refused all proffered compensation. I am under special obligations to him for this favor and his permission to publish in this connection his report of an experiment in feeding ensilage, giving results of interest, especially from a chemical standpoint.

To Mr. W. P. Latta, my assistant, I am greatly indebted for most faithful and intelligent work during the entire time of carrying out this experiment.

It will be borne in mind by any who may think we have been needlessly lengthy in making our report in detail, that it is published mainly for the purpose of giving plain facts to the farmers of our State, who have not given much attention to this subject.

The experiments will be continued another season. We shall plant several varieties of corn, sugar cane, millet, and other forage crops, to ascertain as far as we can their comparative values for ensilage.

Hoping that the expense incurred may result in giving practical information of real value, and so aid in advancing the agricultural interests of our State, I respectfully submit this report.

The following is the report of Prof. Geo. H. Cook, referred to above:

In this bulletin we give the results of a feeding experiment with corn ensilage.

On November 16th four cows of native breed were taken from the herd at the college farm, placed side by side in the same barn, and for a term of ninety-one days were fed, exercised, and milked at the same time.

During the first period of twenty-eight days a ration was divided among them, made up of twenty-two and one-half pounds of clover hay, forty-nine pounds of wheat straw, seventy-five pounds of brewers' grains, seventy-five pounds of turnips, and seven and one-half pounds of cotton seed meal. It was calculated to furnish daily to each 1,000 lbs. of live weight,

2.5 lbs. digestible protein.
0 5 lbs. digestible fat.
12.5 lbs. digestible carbhydrates.

This being, according to German investigators, the necessary amount of food.

For the second period of twenty-eight days no change was made in the ration fed cows Nos. I and II, while in that fed III and IV, 100 pounds of ensilage were substituted for 40 pounds of turnips; in other respects it remained the same as that fed during the first period; it furnished daily to each 1,000 pounds of live weight,

2.50 pounds digestible protein.
.90 pounds digestible fat.
14.90 pounds digestible carbhydrates.

This was fed in order to determine whether an increased amount of the heat-producing compounds, fat and starch, was rendered necessary by the severity of the weather. The additional food caused no increase in the yield of milk; cows I and II on the poorer ration gave during this period more milk than during the preceding.

Our intention thus far was to ascertain the quantity of food required to keep these cows up to their full yield of milk.

For the third period, of five weeks ending February 17, Nos. I and II were fed the same as during the first and second periods; to III and IV an equal amount of digestible food was given daily, in 120 pounds of ensilage and five pounds of cotton seed meal per cow; it was eaten without waste and with apparent relish.

We tabulate below the yield of milk for 13 weeks. It must be remembered that during the first period all four cows received the same ration; that during the second and third periods cows I and II received the same as during the first; that cows III and IV were fed during the second period with an unusually rich ration, and during the third period with one made up of ensilage and cotton-seed meal alone, containing, however, an amount of food equal to that fed during the first period.

	I. 7 yrs. old. Calved July 15.	II. 9 yrs. old. Calved Oct. 8.	III. 6 yrs. old. Calved Oct. 23.	IV. 6 yrs. old. Calved Oct. 10.
	lbs.	lbs.	lbs.	lbs.
Average daily yield for 1st period	23.5	25.1	25.6	24.1
" " " " 2d "	25.2	26.1	24.9	24.
" " " " 3d "	25.2	23.2	23.8	24.
Average daily yield for 91 days	24.6	24.8	24.8	24.

An opportunity is here offered to call attention to the fact that up to a certain point the yield of milk may be influenced by the quantity of digestible food; but beyond this point, which is determined by breed, time of calving, and individual peculiarity, an increased amount of food fails to increase the yield of milk. Ensilage can produce no more milk than any other fodder which contains an equal amount of food, a point well illustrated by the above table.

While the yield of milk and its percentage of butter cannot be increased at will, it is well known that its quality may be very materially influenced by the feeding. It is claimed for ensilage that it makes " winter butter equal to June butter," a claim willingly admitted, butter made from the fodder being to our knowledge of unusually fine color and flavor.

The composition of ensilage is by no means constant, as the following table of analyses shows; soil, variety of corn, method of planting and cultivating, and above all the time of harvesting exert a decided influence on its quality.

The samples furnished by Mr. Platt and Messrs. Whitman & Burrill had the characteristic vinous smell which indicated that they had been exposed to the air before reaching the laboratory—and probably an analysis of a perfect sample would have indicated a larger amount of nutritive matter. From personal observation at the silo, we know that Mr. Platt's ensilage was as well preserved as any we have seen.

In this table the samples have been arranged with reference to their percentage of water and carbhydrates:

	Loss at 212° F. Pr. Ct.	Protein. Pr. Ct.	Fat. Pr. Ct.	Fiber. Pr. Ct.	Ash. Pr. Ct.	Carbhydrates. Pr. Ct.
Mr. Mills, Pompton, N. J.	77.4	1.02	0.68	6.85	1.00	13.04
Mr. Morris, Oakland Manor, Md.	78.51	.88	0.62	6.43	1.53	12.03
Buckley Bros , Port Jervis, N. Y.	80.86	1.27	0.67	5.47	1.00	10.73
Coe Bros., West Meridian, Conn.	82.10	1.21	0.71	5.34	1.02	9.62
Mich. State Agricultural Col., Lansing	82.27	1.63	0.76	4.72	1.94	8.68
College Farm, New Brunswick, N. J.	83.52	.94	0.65	5.18	1.43	8.28
Mr. Platt, Suffield, Conn.	83.56	1.06	0.73	5.76	.81	8.08
Whitman & Burrill, Little Falls, N. Y.	83.54	1.06	0.50	5.85	1.40	7.65
James Lippincott, Mt. Holly, N. J.	84.28	1.37	0.50	4.68	1.26	7.91
Dr. J. M. Bailey, Billerica, Mass.	84.87	1.06	0.45	5.61	.98	7.03

The amount of ensilage to be used depends entirely upon its quality and upon the plans of the farmer.

Mr. Mills, for instance, could make up a full ration for a cow of 1,000 pounds live weight, by feeding daily eighty pounds of his ensilage and five and one-half pounds of cotton seed meal; while at the college farm, with five pounds of cotton seed meal, one hundred and twenty pounds were necessary. In these rations nearly all the carbhydrates needed, and a portion of the protein and fat is furnished at a very low price by the ensilage; the balance of the protein and fat is drawn from the cotton seed meal. If desirable, a much smaller quantity of the ensilage could be used, and the carbhydrates given in form of corn meal or any feed rich in these compounds; in ensilage they can be had, however, much cheaper than in any feed known to us at present. One thing must be considered: If the quality of the ensilage obliges the farmer to feed his cows more than eighty or ninety pounds daily per head, there is reason to fear they will scour. The amounts fed by the above named gentlemen have varied from sixty-five to eighty pounds, and with these amounts no trouble whatever has been experienced. We therefore conclude that if the ensilage is of first-class quality, eighty pounds per day will furnish an animal with the full amount of carbhydrates; if it is of medium quality, it will be safer to limit the amount to about ninety pounds, furnishing the rest of the carbhydrates in form of feed or straw.

From the above experiment we feel justified in concluding that milch cows can be safely fed large quantities of this fodder, and that it is a perfect substitute for hay. The question of expense we reserve for a future bulletin.

GEORGE H. COOK, *Director.*

SORGHUM AND MILLET.

Our silo has been filled this season with Bailey's ensilage corn, which yielded eighteen tons per acre. This was weighed when put in the silo and will be weighed when taken out to determine the loss in weight by this process of curing. The chemical department made an analysis of the corn when put in the silo, and will analyze a sample of the ensilage when the silo is opened. The ensilage will also be compared with corn of the same variety, grown contiguous on same kind of soil and cut up and dried after the ordinary plan. The Doura and Sorghum which were sown to ensilage were not as mature as would have been desirable when the silo was filled; but a load of each was put in the silo. I am convinced that the Doura is not at all equal to corn as a forage plant for us, and I am almost as positive as regards the sorghum. One-half acre plats were sown with German millet, common millet, and Hungarian grass. Of these the German millet seems to be the most desirable both as regards quality and yield.

POTATOES.

Of the potatoes planted we have been pleased with the Early and Late Ohio. The Dunmore yields well and is of very good quality and uniform size. The Champion (a Scotch potato) requires a long season evidently, as the vines are green at this writing, Oct. 14. Clarke's No. 1 promises to be a desirable variety. The Beauty of Hebron is, we believe, not excelled in productiveness and quality by any of these new varieties grown in our experimental grounds this season.

YELLOW LUPIN.

At the suggestion of Dr. Kennedy, State Chemist of Pennsylvania, we began an experiment to determine the comparative value of green manures as shown in the relative advantages of the red clover and yellow lupin. Owing to the failure of the lupin seed to germinate—not one seed in a hundred growing—the experiment has proved a failure, to my regret, as I think this question is well worthy of attention. The lupin is described as a vigorous plant, which attains a height of over two feet, and sends down its long tap root into the subsoil an equal distance. Its foliage is said to be 11.79 per cent richer in nitrogen than the red clover.

NITROGEN EXPERIMENT.

We have been engaged last year and this on what is termed the "Coöperative Nitrogen Experiment," instituted by Prof. W. O. Atwater, of Middletown, Conn.

The object of this experiment is to test the effects of nitrogenous fertilizers in different amounts and combinations upon the growth of the plant, and inferentially its capacity to gather its nitrogen from natural sources.

The fertilizers.—The ingredients and amounts are such as are used in ordinary practice, phosphoric acid and potash being supplied in about the proportions that occur in a corn crop of fifty or sixty bushels, and nitrogen in one-third, two-thirds, and full amount in same crop.

Forms of nitrogen.—The nitrogen is supplied as nitric acid in nitrate of soda; as ammonia in sulphate of ammonia, and as organic nitrogen in dried blood.

Forms of nitrogen.—The nitrogen is supplied at the rate of twenty-four pounds per acre in "one-third ration;" forty-eight pounds per acre in "two-thirds ration;" and seventy-two pounds per acre in "full ration."

In this experiment quite a number of the agricultural colleges are engaged, and the results are to be tabulated and published by the National Department of Agriculture at Washington. This experiment will probably be continued the next two years, when a full report will be made. I append a report which will indicate the effects of nitrogenous fertilizers:

TABLE I.—EFFECTS OF NITROGENOUS FERTILIZERS.

I. Professor Stubb, Alabama, Cotton,
II. Mr. Hicks, New York, Corn.
III. Professor Ingersoll, Indiana, Corn.
IV. Professor Johnson, Michigan, Corn.
V. Mr, Newton, Connecticut, Corn.
VI. Mr. Pierce, Massachusetts, Corn.
VII. Mr. Thorne, Ohio, Corn.
VIII. Mr. Manning, Massachusetts, Clover.

FERTILIZERS AND PRODUCE PER ACRE.

	NUMBER OF EXPERIMENT.		I. Cotton.	II. Corn.	III. Corn.	IV. Corn.	V. Corn.	VI. Corn.	VII. Corn.	VIII. Clover.
			Lbs.	*Bush.*	*Bush.*	*Bush*	*Bush.*	*Bush.*	*Bush.*	*Lbs.*
	0.	No manure	587	16.3	38.2	44 7	12.5	10.3	40.0	480
Preliminary Group	1.	Nitrate of soda, 150 pounds	805	26 0	35.9	53.1	22.5	11.7	44 3	700
	2.	Superphosphate, 300 pounds	1,162	22 8	36.4	51 2	13 8	16 0	48.6	1,200
	3.	Muriate of potash, 150 pounds	564	34.5	34.5	52.0	15.0	17.7	48.6	940
	4.	Nitrate of soda, 150 pounds Superphosphate, 300 pounds	1,599	24,5	33.6	61.6	23.8	14.3	50.3	1,080
	5.	Nitrate of soda, 150 pounds Muriate of potash, 150 pounds	932	29.5	34.5	43.6	23.8	23.0	44.9	560
	6.	Superphosphate, 300 pounds } Mixed mineral Muriate potash, 150 pounds } fertilizers.	1,219	28.2	34.5	59.0	13.8	34 6	52.	1,140
Nitrate of soda Group	7.	Mixed mineral fertilizers (as No. 6) Nitrate of soda, 150 pounds	1,541	29.0	37.3	58 8	23 3	34 0	49.1	1,200
	8.	Mixed mineral fertilizers Nitrate of soda, 300 pounds	1,404	33.8	32.5	55.6	41.7	35.7	45.7	1,460
	9.	Mixed mineral fertilizers Nitrate of soda, 450 pounds	1,242	31.5	33.1	49.1	56.7	41 4	47.4	1,480
	6*a*.	Mixed mineral fertilizers (as No. 6)	3,115	30.0	33.4	56.7	16 3	37.7	46.0	1,660
Sulphate of ammonia Group	10.	Mixed mineral fertilizers Sulphate of ammonia	1,116	27.8	36.1	55.7	28.5	39.4	41 7	1,880
	11.	Mixed mineral fertilizers Sulphate of ammonia	1,265	30.8	38.4	58.9	42.5	40.3	42.3	2,060
	12.	Mixed mineral fertilizers Sulphate of ammonia	1,162	32.5	34.0	50.4	48.3	39.4	43.4	2,400
	6*b*.	Mixed mineral fertilizers (as No. 6)	----------	29.0	35.7	51.0	----------	28.6	48.3	1,440
Dried blood Group	13.	Mixed mineral fertilizers Dried blood, 225 pounds	1,357	37.6	31.0	49.4	28.8	35.4	41.1	1,620
	14.	Mixed mineral fertilizers Dried blood, 450 pounds	1,300	36.3	34.5	51.6	33.8	37.0	41.4	1,940
	15	Mixed minerals (as No. 6) Dried blood, 675 pounds	1,127	35.2	33.4	61.4	40.6	39.0	39.4	2,420
	6*c*.	Mixed minerals (as No. 6)	----------	39.7	33.4	57 1	20.6	----------	40.9	1,200
	16.	Farm manure	----------	----------	----------	----------	----------	----------	43 7	1,500
	00.	No manure	449	16.5	33.1	31.7	13.8	----------	35.4	800

In Professor Stubb's experiment three plots, not mentioned in the table, had "mixed minerals" with cotton-seed meal in quantities to supply nitrogen n the same amounts as in the nitrate of soda, sulphate of ammonia, etc. The yields were: with one-third ration, 1,253.5 pounds; with two-thirds ration, 1,518 pounds; and with full ration, 1,345 pounds per acre.

GRASSES.

On the 9th day of May last we sowed one-eighth acre plats in our experimental grounds with each of the following grasses: English blue grass, foul meadow, orchard grass, alfalfa, red top, Kentucky blue grass, white clover, alsike, and oat grass. We shall add other varieties another spring, and these will be compared as to yield, quality, and value, for pasturage and hay. Most of the plats have made a fair start this season.

WHEAT.

October 1st, 1881, we sowed in plats 12x18 feet, with spaces of three feet between the beds, twelve varieties of wheat kindly sent us by Prof. Lazenby, of the Ohio State University. The samples were clean and of excellent quality, and had evidently been very carefully put up, in marked contrast with some received from the Department of Agriculture.

EXPERIMENTAL WHEAT.—1882.

Name of Variety.	Date of Cutting.	Height in Inches.	Weight of Grain per Acre.	Weight of Straw per Acre.	Weight of Straw per Bushel of Grain.
			Bush.	*Lbs.*	*Lbs.*
York White Chaff	July 20	50	50 5-12	4,840	156
Zimmerman	" "	48	57 5-36	5,041 2-3	148 3-17
Champion Amber	" "	42	48 53-72	4,235	146 26-29
Rickenbrode	" 25	50	42 1-72	4,910 5-6	177 6-10
Russian, No. 2	" 20	44	35 7-24	4,345 5-6	182 6-7
Sandomirka	" "	50	45 3-8	4,537 1-2	160
German Amber	" "	46	47 1-18	5,314 1-6	173 4-7
Heiges Prolific	" "	48	55 1-24	6,150 5-6	170 10-11
Silver Chaff	" 25	50	43 25-36	5,646 2-3	189 3-13
Velvet Chaff	" 20	40	33 1-18	3,831 2-3	174
Hungarian White Chaff	" "	42	43 25-36	4,235	156 12-13
Theiss	" "	38	47 1-18	4,033 1-3	145 5-7

EXPERIMENTAL WHEAT, 1882.—*Continued.*

Name of Variety.	Quality of Grain.	Smooth or Bearded.	Strength of Straw.	Color of Grain.	Size of Grain.	Color of Chaff.
York White Chaff	Extra.	S.	Medium.	White.	Medium.	White.
Zimmerman	No. 1.	S.	Rather weak.	Red	"	"
Champion Amber	No. 1.	S.	Erect.	Red.	Large.	"
Rickenbrode	Extra.	S.	Stiff	White.	"	"
Russian No. 2	No. 2.	S.	Erect.	White.	"	"
Sandomirka	No. 2.	S.	Rather weak.	White.	Medium.	Red.
German Amber	No. 1.	S.	Very weak.	Red.	"	"
Heiges Prolific	No. 2.	S.	Weak.	Red.	"	White.
Silver Chaff	No. 1.	S.	Weak.	White.	"	"
Velvet Chaff	No. 2.	B	Medium.	Red.	"	"
Hungarian White Chaff	No. 1.	B.	Weak.	Red.	"	"
Theiss	No. 1.	B.	Weak.	Red,	"	"

It will be seen from the table that none of the varieties sown proved a failure—indeed, each yielded well. The acre yield is computed from the yield of the plat. We have been specially pleased with the York White Chaff, Zimmerman, Rickenbrode, and German Amber.

We have also grown from seed received from the Commissioner of Agriculture plats of: 1st, Bennett wheat. This is a red, bearded winter wheat, from West Virginia. It has stiff straw, ripens with Fultz, yields well, and is said to produce excellent flour. It seems a very desirable variety. 2d, rice wheat. Another red variety from Maryland. Straw short, heads small, and did not prove satisfactory. 3d, Washington glass. A smooth, white winter wheat, from Cumberland Co., Penn. A strong grower, hardy, and yields well. I think this may prove a good variety for us. 4th, Wysor wheat. A smooth, red, winter variety, from Virginia. We think this one of the best varieties sown.

All of the varieties named have been sown in larger plats this season, and we can speak more positively of their value for Michigan after another year's trial.

The yield of wheat in 1881 was light, as will be seen by reference to the cropping list for that year. This year, 1882, from the forty-two acres grown on the College farm, the yield was 1,475 bushels, a little more than thirty-five bushels to the acre. This was mostly Clawson—some four acres of Shumaker and one of Scott excepted. This year we have sown, aside from the experimental wheats, which embrace three acres, eight acres with Centennial Club, fifteen acres of Clawson, and four acres of Egyptian White Chaff.

RUSSIAN OATS.

Two acres of this variety were sown in our experimental grounds. The yield was 121 bushels. The yield of ten acres of the common white oat in same field was 612 bushels. The straw of the Russian oat is much coarser than that of the common white oat, and will not be so desirable for fodder; they were lodged quite as badly as the others; they weigh no heavier to the measured bushel, and judging from this one trial I should pronounce them not as desirable as the common oat.

CROPPING LIST, 1881.

Field.	Area.	Crop.	Quantity.	Cost.	Rate per Acre.	Remarks.
No. 3.	23.66	Corn, roots, and potatoes	1,262.24 bu. turnips, 358.9 bu. corn, 97.6 bu. potatoes	$317 37	$22 67	A large item in cost is the manure applied. Ten acres devoted to experimental crops.
No. 4.	19	Wheat, hay and pasture.	21 tons hay, 110 bu wheat, 5 tons straw	62 93	3 31	Wheat badly winter killed.
No. 5.	20.50	Wheat and hay.	7.65 tons hay, 200 bu. wheat, 12 tons straw	137 89	6 73	Some portions of this field very good, but many bare places.
No. 6.	27.64	Hay	31.22 tons hay	41 44	1 49	
No. 7.	17.11	Pasture				
No. 8.	23.23	Hay	49.69 tons hay	57 21	2 46	
No. 9.	23.66	Oats	20 tons straw, 1,200 bu.	109 71	4 64	
No. 10.	22.77	Corn	859 23 bu.	247 06	11 14	
No. 11.	23.66	Pasture				
No. 12.	22	Pasture				
No. 13.	23	Pasture				
No. 14.	10	Hay	10.62 tons	16 53	1 65	
No. 15.	14	Wheat	3 tons straw, 75 bu.	140 72	10 05	Only portions of this field were worth cutting.

CROPPING LIST, 1882.

Field.	Area.	Crop.	Quantity.	Cost.	Rate per Acre.	Remarks.
No. 3.	23.66	Oats and experiments	18 tons straw, 733 bush	$140 86	$11 74	Experimental crops not given here.
No. 4.	19	Pasture				
No. 5.	20.50	Hay	44.67 tons	42 11	2 05	Timothy and clover of excellent quality.
No. 6.	27.64	Corn		219 83	7 95	Hathaway Dent.
No. 7.	17.11	Pasture				
No. 8.	23.23	Hay	48.235 tons	42 43	1 87	Clover and timothy.
No. 9.	23.66	Wheat	24 tons straw 821 bush	169 02	7 14	Clawson.
No 10.	22.17	Corn, roots, potatoes, millet, and Hungarian grass		179 59	8 10	
No. 11.	23.66	Wheat	20 tons straw, 654 bu.	230 97	9 76	The wheat grew on 18 acres. Balance of field not plowed.
No. 12.	22	Pasture				
No. 13.	23	Pasture				
No. 14.	10	Hay	9.957 tons	17 27	1 73	
No. 15.	14	Pasture				

THE FARM.

The farm embraces 676 acres. It is crossed, towards its southern boundary, by the Grand Trunk and Detroit & Northern railroads. Eighty acres on the north side are embraced in the campus, lawns, vegetable gardens, and orchards, and are managed by the Horticultural Department. The nearly 600 acres remaining are in charge of the Farm Department. About 300 acres have been cleared, leaving some 300 acres of timber still on the farm. Of the 300 cleared, only about 190 acres have been plowed; the remaining portion is in woodland pasture. Quite a large portion of this is low, and must be drained to be of value. It is being cleared of stumps as fast as practicable, and a portion of it will soon come under the plow. The improved land has been tile drained, and is now in condition to be tilled to good advantage. The soil is largely clay, and may be considered as good wheat and grass land.

CROPS.

On the 167 acres of improved land the following crops have been raised this season, 1882: 42 acres of wheat, yielding 1,475 bushels—35 bushels per acre; 12 acres of oats, yield 733 bushels—acre average, 61 bushels; 51 acres of meadow, giving 102.85 tons of hay, or two tons per acre; 12 acres were appropriated to experimental crops referred to elsewhere; 5 acres to roots, which promise well but are not harvested at this writing; nearly 50 acres of corn, estimated at 2,000 bushels. The season has all in all been a very favorable one, and our labors have been rewarded with abundant harvests.

With the improvements in buildings, implements, and live stock, and the farm fixtures in good condition, we are furnished with excellent facilities for the practical work of the Department.

AGRICULTURAL CLASS ROOM.

The need of a good class room, properly arranged and furnished, has been a felt want by this department. To teach practical agriculture in the class room with success, demands facilities for illustration and appliances for their use quite as much as in other departments. The State Board of Agriculture has recently set apart the old library room in College Hall for this purpose. It is hoped that this can be so fitted up and arranged as to meet the requirements of the department in this particular.

DONATIONS TO THE FARM DEPARTMENT, 1881, 1882.

S. N. Fox, St. Louis, Mo.:
Potato Bug Exterminator.
Oliver & Son, South Bend, Ind.:
Two Oliver Chilled Plows, complete.
Gale Manufacturing Co., Albion, Mich.:
One Gale Three-Horse Plow, complete.
Prof. W. Lazenby, Columbus, O.:
12 Varieties Winter Wheat.
National Department Agriculture, Washington, D. C.:
6 Varieties Winter Wheat.
George Stuart, Grand Blanc, Mich.:
1 Pair Jersey Red Pigs.
Ann Arbor Patent Whiffletree Co., Ann Arbor, Mich.:
Plow Harness and Whiffletrees, for plowing orchard.
C. Hills, Delaware, Ohio:
Ohio Short Horn Record. Vols. 1 and 2.
James Buckingham, Zanesville, Ohio:
Devon Record. Vol. 1.
Ayrshire Breeders' Association:
Ayrshire Record. Vol. 3.
Hon. H. G. Wells, Kalamazoo, Mich.:
Jersey Cows, Sketch of.
Practical Farmers. Vol. 1.
W. K. Sexton, Howell, Mich.:
Holstein Cattle, Sketch of.
J. R. King, Meridian:
Machine for Raising Buildings, Photograph of

STUDENT LABOR.

This problem has engrossed much of my attention, for it is one of the great questions in this department. Our College has been almost, if not quite alone, in maintaining a distinctive labor system, that makes it compulsory upon all students to devote three hours of each afternoon to labor upon the farm or garden. Other colleges have adopted this system, but have found so many difficulties in the adjustment and supervision of student labor that they have given it up after a brief trial. True to the spirit of its founders, and I believe in accord with the public sentiment in our state, those in charge of this College have steadily persisted in holding to the grand idea that the practical and the theoretical of agriculture shall here go hand in hand; but while this is true, it by no means follows that the difficulties have all vanished after the experience of more than a score of years. How to manage this large force of students, for this brief time each day, with the least possible loss (they cannot by any management be handled with profit to the departments), and so that they shall retain their sympathy with labor and the laborer, gain correct notions of farm methods, economy and practice is the problem which meets us daily.

The objects to be reached by our system of student labor are as I understand them:

First. To keep hands and mind in sympathy with labor. This is paramount to every other consideration. The young man, who in his college course imbibes, as so many do, a sort of contempt for manual labor and the man who performs it, and who gets very stilted notions about culture and the exalted character of the work he must do, because, forsooth, he is a graduate, is not calculated to blossom out into the common-sense, aggressive, enterprising young American who is ready to do anything honorable, until something better offers, and who is sure to make his way in the world. The influence of putting on a work dress and engaging in manual labor a part of each day has a tendency to fix the *habit* of labor, if real work is performed (if it is a sham, a make-believe work, it is only a curse), and the effect is salutary upon the student. It gives him a kind of right self-reliance and independence if he is honest with himself and his work, that he would not be likely to secure in any other way, and that is of incalculable value in the formation of character.

Second. The labor system gives students the privilege of earning a portion of the necessary expenses incurred in pursuing their college course, thus enabling many to enjoy the benefits of study here, who would not feel that they could do so without this opportunity of defraying their own expenses in part. I may say in this connection that those students who have found it necessary to be doubly diligent in their college course to secure needed funds, have usually graduated with honor, and to-day are among the most honored of the alumni of this College.

Third. Out door labor promotes bodily health. "A sound mind in a sound body" is as essential in agricultural pursuits as in any other, and there is nothing more desirable as a health preservative than plenty of work in the open air.

Fourth. The labor system was designed to accomplish all I have named, and it has always been and is the first thought of those in charge, to so arrange the labor and secure such competent supervision that, while for the students' sake it was paid labor, it should be as far as possible educational in its character, affording the student ample opportunities for observing the manipulations of farm work in all of its details, and to have more or less of actual practice in them all, thus giving him the privilege of familiarizing himself with the best methods of tillage and stock husbandry, of gardening and horticulture. A moment's thought will convince any reasonable critic that it is much easier to plan and indicate on paper how all this shall be accomplished, than to execute and carry to successful issue such plans. The farm department is sometimes criticised by those who think that every young man who graduates here should know all about practical farming and *turn out a farmer*, and because some of our graduates seem to know little of the details of farm work, and engage in other occupations after graduation, they brand system, management, and all as a failure. Now, I am happy to say that a good per cent of our graduates are farmers—not all. Many young men come to us who have fully decided to follow some one of the professions. We do not expect to change their plans during their course; but we do hold most strongly to the idea that the practical instruction our work system gives will quite likely be of great value to them in after life. Is there a profession, or business, or position in the wide world, worthy of a true man's ambition, where practical knowledge of every day affairs would not often come in play to great advantage? It seems to me a little unfair to select the work departments for such criticism as I have named. A student takes his mathematical course (I use this only to illustrate the point, as it is equally true of all courses). He manages to get through the examinations, but he has had no liking for mathematical studies. Now, how much does he know of mathematics? It is safe to say that he does not know nearly as much as he might have known. Does any one think of criticising the mathematical department because of his stupidity, or carelessness, or lack of application? Most assuredly not. And so in practical work we should remember that not every student (most do) will be interested and make the best use of his opportunities. Some will fail in application and attention to practical work, and as a necessary result go out with very limited knowledge of the farm and its details. I think there is a tendency to look upon the labor system as a part and parcel of the farm and horticultural departments—a something for which these departments should be held to strict account, while the other college departments are relieved from all responsibility in the adjustment of this, *the most difficult and perplexing of all our college work.* Now, I think I am right in saying that while the farm and horticultural departments have the oversight of this labor directly, and are in no wise to shirk any responsibility which consistently attaches thereto, it can only fairly be said that they in common with each and every other department are responsible for its success or failure—no more, no less. The rules of labor are made by the Faculty. Each department has voice in these. Is the farm or horticultural departments in any way benefited by the exercise of this labor system more than the chemical, the mathematical, the botanical, the entomological, the English? Does not this college owe its very existence to-day to this labor system? Are not the departments which enter into its make-up, then, alike dependent upon it and responsible, to a certain extent, for its management? It is not the labor system of the farm or the horticultural departments, of the chemical or botanical. It is the labor system of the Michigan State Agricultural College. To succeed, it must have the moral support of all college authorities; it must be thought of sufficient importance to receive such place and recognition in the curriculum of study as its value and the grave interests attaching to its administration demand. I believe there should be at least a half hour of each week assigned to the superintendents who have the labor in charge, and this should be in the curriculum and observed as strictly as any college recitation, when the superintendent should discuss, in a practical way, questions connected with the labor system—the rate of wages, plans of work, details of operations, etc. Much might be done even in this brief time to encourage the good feeling and mutual understanding between the department and students, which are so essential to success in relations of this character.

Again, the Professor of Agriculture. who superintends the farm, and the student labor thereon, and who is held directly responsible for its management, should have the class assigned to the farm for labor, for class-room instruction, to make the work efficient. Now I have the freshmen, their second term, in agriculture, and do not see them again for class-room instruction until the last term of their senior year. The Sophomores are now, and have been for years, assigned to the farm department for labor the entire Sophomore year, but as Professor of Agriculture I do not have a single opportunity to see them in class-room during this time. It seems to me this is a grave mistake, and increases perceptibly the difficulties of managing student labor.

While I am aware that our course of study is crowded, and it is not easy to omit anything, I cannot help affirming that our labor system is of sufficient importance to demand the small portion of time I have named for this purpose.

Two of the great difficulties we have to contend with practically are, finding work for so large a force, especially at those seasons of the year when the farm does not offer much out-of-door labor, and the lack of competent supervisors of student labor. Men of skill, energy, patience, good nature, coupled with firmness and tact, quick to see and prompt to decide, are needed for this work. To keep competent men for this work only, supervising students three hours in the afternoon, would entail a large additional expense upon the department. What work could be given them profitably when not engaged in supervision I am unable to say.

I believe the only practical solution of this question is to train students for this work. Make those who have always been attentive to labor duties, and have acquired some skill in the practical details of farm operations, overseers of gangs and allow them extra compensation therefor. The thought of some preferment of this kind I fancy would be something of a stimulus to students, make them more thoughtful of and attentive to labor duties. Such supervision would require constant attention and oversight from those in charge, but given some of the conditions I have suggested, I think it would prove an advance method if not an absolute success. Then the marking of the labor performed by the overseer in charge the same as a recitation, I believe will be found advantageous. We find this plan works very well on the farm. We began it as an experiment at the opening of the present College year. So far I am pleased with the plan.

I may very properly refer here to the labor of the students on the farm during the time covered by this report. Here, as elsewhere, some are found who believe "the former days were better than these," and with a pride pardonable, perhaps, because of past association, assert quite strongly that students use to work better, more steadily than in these latter days. In other words they fear there is a tendency to decline in the vigor and efficiency of our labor system—that there are more absentees from work and more excusing of students from this exercise than formerly.

"One generation passeth away and another cometh," but the human nature of both is very like in its manifestation, and the alumni who glance at this report will pardon me for saying what I believe they will admit as too true, that in their class, the best of all, there were some shirks, some drones, some good fellows who came to College constitutionally tired and never got rested during their college course so that they engaged in labor with any spirit. The classes of the present day do not greatly differ from their predecessors. I can say very decidedly, so far as my department is concerned, that students have been as punctual and attentive to labor duties as we could reasonably expect. We have been, and we intend to be, as strict in enforcing labor rules as we are in enforcing those requiring attendance upon classes. We are not inclined to the Utopian idea that the system is perfect or the management faultless, but we are striving with firm heart to realize what we believe is a practical ideal—taking things as they are, not as we might desire them.

The only answer I need make to any of these doubters in the efficiency of our labor system is to say, that while we have reduced the number of men employed on the farm so as to give more labor for students, with a less number of students on the farm (as a larger proportion have been employed on the garden than ever before, one-half instead of one-third as formerly), the farm work has been promptly and seasonably attended to, and our work in permanent improvements, ditching, laying tile, clearing, and stumping fields, and labor on and about buildings will compare very favorably with that accomplished during any two years in the history of the department. It follows as a logical sequence that as the working force is largely students, they must have labored, and that punctually and with energy to have accomplished so much. If any doubt we shall be pleased to show them the work performed and the records made.

I have devised some plans to furnish labor to students at those seasons of the year when the farm offers but little, but as there is some prospect of arranging for a mechanical course which will occupy students a portion of the time in shops, and thus necessitate changes in our courses of study, as well as our work, I defer their presentation. I desire to record my grateful appreciation of the advice and encouragement of President Abbot in all matters relating to the adjustment of student labor and the development of the farm department. Conversant with the peculiar perplexities of the management, he has been always ready to give aid and support to any plan or change that seemed to promise increased efficiency.

DISBURSEMENTS OF FARM DEPARTMENT.

Current Expense.	Sept. 1, 1880, to Sept. 30, 1881.	Sept. 30, 1881, to Sept. 30, 1882.
Labor	$974 21	$963 95
Permanent improvements	64 91	140 00
Implements	49 62	291 04
Repairs of implements	59 45	95 56
Cattle	1,578 85	1,531 84
Sheep	23 27	58 49
Swine	144 36	218 59
Team	103 68	33 60
Office	44 70	124 83
Repairs of buildings	29 20	73 53
Seeds	16 84	60 99
Farm house	770 31	638 73
Fertilizer	4 25	3 25
Drains	-------	14 89
Student labor	1,656 63	1,541 57
Experiments	-------	17 01
	$5,520 28	$5,807 87

Special appropriations	$6,927 37	
Expended as follows:		
Buildings		$2,989 96
Hand implements		85 71
Models and apparatus		94 55
Fences and bridge		181 05
Farm house		87 02
Drains		405 32
Sheep		602 30
Swine		188 00
Ensilage experiments		309 28
Cattle		1,984 18
		$6,927 37

Current Expense.	Sept. 1, 1880, to Sept. 30, 1881.	Sept. 30, 1881, to Sept. 30, 1882.
Cash receipts of Farm Department:		
Lumber	$ 88	$4 00
Men and team	123 36	39 10
Students	112 50	71 20
Cattle	1,989 56	2,381 67
Team	25 39	7 50
Sheep	784 04	384 82
Swine	396 57	422 30
Grain	796 43	1,357 05
Potatoes		27 15
Repairs of implements	59 59	3 39
Farm house		963 28
Wood	472 92	66 69
Drains	16 35	19 78
	$4,777 59	$5,747 93

SUMMARY OF RECEIPTS AND DISBURSEMENTS OF FARM DEPARTMENT FROM SEPT. 1, 1880, TO SEPT. 30, 1882.

Disbursements as seen in classified statement above:			
Current expense, 1880, 1881		$5,520 28	
Special appropriations, 1880, 1881		2,182 46	
Current expense, 1881, 1882		5,807 87	
Special appropriations, 1881, 1882		4,744 91	
Receipts as seen in classified statement above:			
Cash received, 1880, 1881			$4,777 59
Cash received, 1881, 1882			5,747 93
Inventory, Sept. 30, 1882	$25,527 48		
Inventory, Sept. 1, 1880	17,480 62		
Increase of inventory from Sept. 1, 1880, to Sept. 30, 1882			8,046 85
Balance		316 85	
		$18,572 37	$18,572 37

The large increase in inventory during the two years ending Sept. 30, 1882, is largely due to the purchase of thoroughbred stock, and the increase in the herds as seen in the enumeration of stock. The farm and buildings thereon are not embraced in this inventory, nor any items that properly belong to permanent improvements. When it is remembered that we have expended for new buildings, $3,450.96; for posts and boards, fencing, $181.05; drains, tile, etc., $405.32; well at farm-house, $140; other permanent improvements, $167.64; total, $4,344.97; and that aside and independent of this amount we have a small balance on the right side of the account, as seen in the above summary, it will, I think, be considered as a fair showing for the farm department. I may say that we have not in our plans and work been giving undue prominence to the financial outcome. To make the department most efficient, of most practical value to students with the means at our command, has been our first thought. To do this with that that true economy and regard to business which are underlying principles in all successful practical management has been our purpose.

I may not close this report without expressing my obligations to the State Board of Agriculture for hearty coöperation and support in my plans for the improvement of the department.

Mr. A. Birch, the farm foreman, and Mr. W. Brown, the herdsman, merit most kindly mention. In these reponsible positions each has been attentive to duty, and interested in promoting the efficiency of the department.

All of which is respectfully submitted.

SAM'L JOHNSON,
Professor of Agriculture and Superintendent of the Farm.
AGRICULTURAL COLLEGE, Oct. 20, 1882.

REPORT OF THE SUPERINTENDENT OF THE HORTICULTURAL DEPARTMENT.

To the President of the State Agricultural College:

The following is a brief report of improvements and work done in the Horticultural Department during the College year ending September, 1882:

LANDSCAPE GARDENING.

The main drive up from the west gate to the President's house has been widened eight feet, and a gutter has been put on the north side. The river bank has been repaired and sodded as far as the Botanical Laboratory. This drive has been repaired and the whole from the west gate graveled over. A new drive has been laid out on the west side of the Chemical Laboratory, running to the greenhouses. The lawn about the chemical laboratory has been laid out entirely new and provided with walks around the building. The grounds about Wells Hall have been graded, sodded, and walks and drives have been put in order. The old bed of asparagus has been taken off, and the whole area graded and seeded down, or graveled over. Around the President's house the flower beds have been changed into more suitable forms and filled up with other soil and compost. The lawn about the new library building has been graded and new drives laid out. The whole has been seeded down and a plantation of shrubs and shade trees set out. Tile has been laid for draining the steam holes in front of Wells Hall down to the ice house. The compost heap has been turned over several times and enlarged. Gravel has been put on over nearly all the drives.

TRANSPLANTING TREES AND SHRUBS.

Different kinds of evergreens and shrubs have been planted in some of the beds and lawns. I prepared and subsoiled a piece of ground in the garden, west of the apple orchard, for nursery purposes. Cherry trees have been planted out there, and between the rows, gooseberries and currants. We received as a donation from Mr. Bragg, of Kalamazoo, 40 young apple trees and 12 peach trees, of different and very good varieties, which have been planted out. Apple, pear, plum, cherry, quince, peach, and apricot seed have been sowed in rows, and some of the young plants are ready to transplant next fall.

THE VEGETABLE GARDEN

Has been for the year under my own supervision. I have had the assistance of Mr. F. Sindlinger as foreman, and am now having, in addition, the very efficient and intelligent aid of Mr. E. D. Millis, a recent graduate. The hot beds have been enlarged. We raised lettuce, cucumber, melons, radish, carrots, cabbage, cauliflower, celery, tomatoes, pepper, egg plants, etc., and had full success. Considering the unfavorable weather some crops in the garden are very good. The garden has been planted out as follows:

North Side, First Square.

1 row corn, Early Minnesota.
1 row corn, Early Narragansett.
11 rows corn, Egyptian Sweet.
10 rows corn, Excelsior.
17 rows corn, Stowell's Evergreen.
4 rows beans, Early Valentine.
5 rows turnips, Red Top.
1 row Blood Turnip Beet.
7 rows beans, Golden Wax.
4 rows peas, Champion of England.
2 rows peas, Carter's First Crop.
4 rows peas, American Wonder.
3 rows peas, McLellan's Advance.
2 rows Beets Blood Turnip.
7 rows turnips, Red Top.
3 rows carrots, Early Horn.
2 rows beets, Blood Turnip.
6 rows turnips, Red Top.
6 rows beans, Early Valentine.
2 rows beets, Blood Turnip.
10 rows strawberries, different kinds, planted out this spring.
4 rows tomatoes, Perfection, Acme, Improved Trophy.
1 row Brussel Sprouts.
3 rows cabbage, Late Drumhead.
1 border with pepper, Large Belle, Cayenne.
1 border egg plants, N. Y. Imperial Black Pekin.
1 border leeks.

North Side, Second Square.

22 rows onions, Red Wethersfield, White Globe, White Portugal, and for general crop, Yellow d' Anvers.
7 rows salsify, or vegetable oysters.
16 rows parsnips.
6 rows carrots, Improved Long Orange.
4 rows cabbage, Early Wakefield.
1 row cabbage, Savoy.
2 rows cabbage, Early Flat Dutch.
2 rows cauliflower, Early Erfurts.
1 row cabbage, Late Drumhead.
1 row potatoes, Queen of the Valley.
½ row potatoes, St. Patrick.
½ row potatoes, Mammoth Pearl.
1 row potatoes, White Elephant.
1 row potatoes, Late Beauty of Hebron.
12 rows potatoes, Burbank's Seedling.
11 rows potatoes, Beauty of Hebron.
30 rows potatoes, Early Rose.

South Side, First Square.

2 rows horseradish.
5 rows squashes, Imperial Turban.
9 rows squashes, Hubbard.
1 row squashes, Vegetable Marrow.
1 row squashes, Boston Market.
4 rows squashes. Summer.
3 rows pumpkins, Large Cheese.
2 rows cucumbers, White Spined.
2 rows watermelons, Phynneys.
2 rows watermelons, Black Spanish.
2 rows watermelons, Mountain Sweet.
3 rows muskmelons, Hackensack.
3 rows muskmelons, Nutmeg.
12 rows asparagus.

South Side, Second Square.

1 border with thyme, sage, sheives, and endive.
6 rows lettuce, Curled Simpson.
6 rows lettuce, Boston Market.
6 rows lettuce, Ferry's Price Head.
4 rows cabbage, Late Drumhead.
1 row cucumbers for pickles.
6 rows celery, London Red, Boston Market.
4 rows corn, Early Minnesota.
25 rows potatoes, Beauty of Hebron.
25 rows potatoes, Burbank's Seedling.

LAWNS.

Our lawns have been badly damaged by white grubs. The injured places have been worked over and reseeded. Trenches have been made for laying tile whereve rneeded, and appear to be satisfactory.

APPLE ORCHARD.

Considerable pruning has been done by the Junior class, and it will take two years more before the trees get to the right shape.

CHERRY, PLUM, AND PEAR ORCHARD.

The regular spring pruning has been done here, and the grounds cultivated and cleaned.

VINEYARDS.

The one near President Abbot's house I consider a failure. A great many of the vines are lost on account of too heavy soil. We can have no success there. The one near Well's Hall gets on better. The new wood is splendid, and after one year's more care, it will produce fruit.

BLACKBERRIES AND RASPBERRIES.

These are situated in the garden. For further bearing they have to be transplanted in the fall and removed out of the garden, on account of too poor soil.

STRAWBERRIES.

Our last year's general planting was the "Wilson" for the general crop; they have not been very successful. I received from Mr. Byron Lower in Mount Pleasant, Mich., as a donation, 200 plants of strawberries, which he calls "Mammoth Excelsior." The greatest part were planted on President Abbot's garden. I can say that I never saw a strawberry doing as well in every respect. The fruit is of the largest size and very solid, while its flavor is unsurpassed. It is one of the freest growing varieties, and consequently will be suitable for most all soils. It will be certainly for next year our general crop.

Respectfully submitted.

LOUIS KNAPPER,
Superintendent of the Horticultural Department.

REPORT OF THE PROFESSOR OF CHEMISTRY.

To the President of the State Agricultural College:

The State Board of Agriculture having requested the officers of the College in their annual report "to give considerable fullness to the condition of the departments, their buildings, courses of instruction, means of illustration and experimentation, and in addition suggestions for the enlargement and perfection of their departments," I herewith submit an extended report of the condition, working, and needs of the Chemical Department for the current year.

CLASS INSTRUCTION.

Autumn term.—During the first term of the College year I gave a lecture daily in Elementary Chemistry to the Sophomore class, the subject matter of the lecture being thoroughly illustrated by elaborate experiments. The class spent four hours a week for a part of the term in repeating and verifying these experiments in the laboratory. This laboratory work was not required of the class, and involved certain expenditures to pay for the chemicals they used. The interest of the class in this study was shown by the fact that every member of the class paid his fee and took the full course in chemical manipulation. The value of this work is to be measured not alone by the increased familiarity with the subject matter, but also by the dexterity acquired in performing chemical experiments, which will be of great use in after life, especially if any become teachers of Physical Science.

During the same term I gave a full course of lectures to the Junior class in Agricultural Chemistry, the subject matter being fully illustrated by experiment wherever it admitted of experimental demonstration. In these lectures I endeavored to give full information concerning the applications of chemistry to agriculture in all its branches, with special reference to the uses of chemistry in farm operations of every kind.

The instruction during the autumn term is given entirely by lectures, the lecture of each day being reviewed at the opening of the succeeding day's lecture by a terse and vigorous questioning of the class on the subject matter.

Spring term.—One lecture a day (with ample experimental illustrations) was given to the Sophomore class, finishing elementary chemistry and completing organic chemistry; a few additional lectures on Blowpipe Analysis (determinative mineralogy), and on Quantitative Chemical Analysis by volume (Volumetric Analysis). The class (in two divisions) spent one hour a day in laboratory practice in Blowpipe Analysis and in Volumetric Analysis (Acidimetry, Alkalimetry, etc.). I thus had charge of the Sophomore class for three hours a day for the spring term, but my assistant in chemistry had personal supervision of the class during laboratory work.

During this term I heard the Junior class in a daily recitation in Ganot's Physics, the subject being very fully illustrated by experiments with excellent apparatus, much of it new.

Summer term.—The Sophomores spent three hours daily in chemical analysis, making separate determinations of the chemical composition of one hundred substances. In this list were included a large number of commercial and technical products. The following extract from the College Speculum exhibits one phase of their work:

ANALYTICAL RESULTS IN THE CLASS-ROOM.

The Sophomore class in their work in chemical analysis have combined work and play in the analysis of various substances which at different times have flooded the markets of our State. Some of the results already reached by the class are given here, with the cost of the article and the price at which it was offered for sale:

1. *Coaline.*—Eight ounces of sal soda (carbonate of sodium) in a gallon of water, with a few drops of nitro-benzol to give it an agreeable odor. Costs 3 cents a gallon; retail price 40 cents.

2. *Silver Plating Fluid.*—An ounce vial of solution of nitrate of mercury, which will form a temporary silvery coating when rubbed on brass, copper, or silver, which speedily tarnishes when exposed to the air. Cost 3 cents; retail price 50 cents.

3. *Nickel Plating Fluid* is the same as 2, except that a little nitrate of copper and nitrate of nickel are added to the solution of nitrate of mercury. Cost 3 cents; retail price 50 to 75 cents.

4. *Fire Test Powders*, to prevent explosions in kerosene lamps, the breaking of lamps and chimneys, and the danger of burning from the use of low-grade oil. These are pill-boxes containing one or two ounces of common salt, colored with aniline red. Cost 1 cent a box; retail price 60 cents, or two for a dollar.

5. *Fire Proof Powder* from Wisconsin is water-lime. Cost ½ cent; retail price not known.

6. *Silver Polish.*—Pill-box filled with water-lime. Cost ½ cent; retail price 25 cents.

7. *Ozone.* A package of about ½ pound weight, consisting of pulverized sulphur, colored with lampblack and scented with oil of cinnamon. Cost 4 cents; retail price $2.00.

8. *Spear's Preservative Fluid* consists of one ounce of bisulphite of soda dissolved in a pint of water. Cost 5 cents; retail price $1.50.

9. *Marie Fontaine's Moth and Freckle Cure.*—"For external use only. Put the contents of this package into an eight-ounce bottle, and then fill with rainwater." The package contains thirty-two grains of corrosive sublimate, or mercuric chloride. Cost ½ cent; retail price 50 cents.

I also gave a course of lectures to the Junior class on meteorology, giving the general principles of meteorology and climatology, bringing into special prominence the recent advances in meteorology by means of the splendid contributions to this science by the United States Signal Service. I aimed to elucidate such principles and offer such information as will assist the student in acquiring such an insight into the laws of storms and the natural succession of meteorological phenomena as will enable him to make a forecast of probabilities of the weather which will be of great value in operations on the farm, in securing his crops, guarding his fruits and caring for his stock. The successful farmer needs to be wiser than Solomon when he said, "He that observeth the wind shall not sow; and he that regardeth the clouds shall not reap." That was said before daily announcements of probabilities of the weather were telegraphed from Dan to Beersheba. The farmer needs to observe the wind and regard the clouds if he would win from the joint action of wind and clouds the best possible results in field, fruit, and flock.

It will be seen from this summary of class-room work that I have had supervision of classes averaging nearly four hours a day for the entire college year, a number no teacher should attempt to fill, especially when it is remembered that the preparation of experiments and illustrations consumes an equal number of hours, to say nothing of the absolute necessity for a teacher to keep fully abreast with the constant advancement in the sciences in which he gives instruction. I have charge of classes for double the number of hours of the average of professors at this College, notwithstanding the large amount of time that must be consumed in the preparation of my experimental illustrations outside of class hours. It is obvious that one of the pressing requirements of this department is that my work shall be divided, an additional teacher in chemistry appointed, and thus something like equality in the distribution of the work of the College be secured.

OUTSIDE WORK.

Onerous as are the duties in the class-room the work which comes upon me from sources outside the class-room is nearly overwhelming. I will call attention to a few of these.

Correspondence.—I receive a large number of letters and on a great variety of topics. Many of these should be directed to other officers, *e. g.*, asking information in regard to admission to College, the qualifications and requirements for admission to the higher classes, special opportunities for study; inquiries concerning the stock kept at the College, kinds of animals for sale and prices, where and how to secure animals for breeding purposes, etc. Many write to ask about the capabilities of Michigan soils for general farming purposes, their adaptation to fruit raising or stock breeding; others in regard to the health of the State, or the healthfulness of particular localities; others concerning the value of certain articles of diet and their influence on the human economy, or how to detect the more common adulterations of food; others ask for information about books treating on special subjects; some how to make hair grow, and others how to take it off. In short, letters pour in upon me in number and variety of topics that will find parallel only in those sent to that treasure-house of all useful information, the newspaper editor! It would take no small part of the time of one clerk to answer the inquiries which cannot be neglected without giving serious offence.

Materials for Analysis.—A bewildering variety of substances are sent here for chemical analysis. Marls, mucks, minerals of great variety, ores innumerable, clays, and plastic materials, soils, limestones, building stones, patent medicines, secret nostrums, hair dyes, corn cures, lotions, liniments, culinary and potable waters, mineral waters for the detection and identification of the curative agencies which they do not possess, etc. Analyses for medico-legal purposes, the detection and punishment of crime. These and kindred subjects for investigation serve to fill up the spare hours of the chemist!

Meteorological Observations.—The meteorological observations which were begun in 1863 have been continued to the present time, giving more than nineteen years of continuous observations. They are the most complete record ever kept in this State, and will become more valuable each year.

Farmers' Institutes.—The farmers' institutes which were inaugurated in 1875 mainly through my efforts have been continued up to the present time. They have accomplished so much good, have given such an impetus to everything pertaining to agriculture, and been so instrumental in bringing into harmonious action all classes who are interested in the greatest and noblest of human avocations that it is no wonder they have spread into neighboring states. The interest thus awakened in all that pertains to agriculture will spread and deepen as the years flow on.

I attended the Farmers' Institutes in Greenville and Macon last January, and delivered at each place a lecture on the Ripening of Wheat, giving the chemical composition of wheat at different periods of ripening, from the earliest formation of the berry up to dead-ripeness. The grain (Schumacher and Clawson) was gathered at intervals of 24 hours for 21 days in succession, and the 42 specimens of grain were submitted to careful chemical analysis, by which means the successive chemical changes in the development and ripening of the grain were accurately determined. This paper was also read before the Society for the Promotion of Scientific Agriculture at its meeting in Cincinnati in August, 1881. It has attracted attention not only in this country, but also in Europe. W. H. Brewer, Professor of Agriculture in Yale College, publicly said in Cincinnati that "this is the most important contribution ever made to the chemistry of the ripening of wheat." The results of this investigation are embodied in the Agricultural Section of the United States Census.

Miscellaneous Investigations.—I have made many investigations which would be difficult to classify, such as the contamination of cistern water, sources of such defilement and means of prevention; modes by which wells become foul by organic filth, the means of averting untimely frosts in spring and autumn, etc., etc. Some of these articles have been widely circulated in the public press.

American Public Health Association.—I was elected a member of this Association in 1873. I have attended many of its meetings. In 1879 I was elected 2d Vice President; in 1880, 1st Vice President, and in 1881, President. These are highly prized honors, but they impose heavy duties. The duties of President this year made a large demand upon my time and energy both in extensive correspondence and in attendance on the meetings in St. Paul and Indianapolis. The object of the association is the promotion of the public health. As no class in the community are more interested in the public health than farmers, and more benefited by its preservation, it seems proper that a Professor in an Agricultural College should contribute what lay within his power to advancing the public health.

Hand-Book of Chemical Analysis.—In 1869 I prepared and privately printed a HANDBOOK OF INORGANIC ANALYSIS for the use of my students, and printed a second edition in 1875. This Handbook has been used as a text-book in five colleges. The demand for the book has been so great that the second edition is exhausted, and I shall prepare a third and enlarged edition the coming winter.

Society for the Promotion of Scientific Agriculture.—I have been a member of this Society from its first organization; have attended all its meetings, and read papers at all its annual meetings.

EXPERIMENTS IN SORGHUM.

The last Legislature appropriated, for the Chemical Department, $1,500 a year for 1881 and 1882, for the purchase of apparatus and for special investigations in chemistry. One of the topics which leading members of the Legislature desired to have specially investigated was sorghum as a sugar-producing plant, and its capabilities to furnish a desirable table syrup. Last year an acre of amber cane was raised on the College farm, and this year an acre and a quarter. Better results would have been secured if broom corn had not been planted in close proximity to the cane both years. I knew nothing of this arrangement till too late for remedy. A Victor mill and Cook's Automatic Evaporator were purchased from the Blymer Manufacturing Company, of Cincinnati. With these appliances the crops of sorghum for two years have been worked up. The quantity of sugar yet produced is not large, but the beautiful specimens now in my possession are significant of possibilities in this direction, while the quality of table syrups produced, at a cost not exceeding 25 cents a gallon, shows that the farmers may supply themselves with a table syrup of the best quality, entirely free from all grassy or sorghum taste, at a cost far below the glucose syrups now flooding the markets. With more costly apparatus, defecators and vacuum pans, I have little doubt that sorghum sugar can be manufactured of good quality and at remunerative rates. With the abundant production of sugar and syrup from sorghum, and the perfecting of the electric light, our people may yet find a very literal fulfillment of the demand of Dr. Arnold for human advancement—*"sweetness and light!"*

EXPERIMENTS ON THE SOURCES OF NITROGEN IN PLANTS.

The vexed problem in agricultural chemistry is the source of the nitrogen in plants; the most pressing demand in high farming is an abundant and cheap supply of available nitrogen. In order to make some contribution to this subject for both the reasons assigned, I devised and carried out a set of experiments bearing on the question whether the nitrogen contained in the vegetable matter of soils (humus) might not be a source of combined nitrogen for certain orders of plants, while other orders would fail to secure a supply from this source. In these experiments flower pots were filled with soil from which every trace of combined nitrogen had been excluded except that contained in humus; in such soil clover, beans, and peas were planted as representatives of one class of plants, and wheat as the type of a different class. A profound interest was awakened in this subject in the mind of every one who saw these experimental plants. A paper on this subject was read before the Society for Promotion of Scientific Agriculture at the meeting in Montreal, and the facts, as far as they were developed, were eagerly caught up by the public press. It is proposed to repeat, verify, and extend these experiments next year.

NEW APPARATUS.

A large part of the special appropriation for the Chemical Department has been expended in the purchase of new and improved apparatus, especially for the study of physics. Most of this apparatus was manufactured by Ducretet, of Paris, and specially imported for the College by J. W. Queen & Co. Prominent among these new acquisitions I enumerate the following: Saccharimeter, Soleil Ventzke, Crooke's Tubes, to illustrate the 4th state of matter; Melloni's Apparatus, for radiant heat; Tyndall's Apparatus, for the conversion of force; Carre's Freezer; Browning's Spectroscope, (2 prisms); Dubosc's Phosphoroscope; Arago's Apparatus, magnetic rotation; Faraday's, ditto; Rhumkorff Inductorium, giving sparks 23 centimetres; Crova's Actinometer; Noremberg's Polarizing Apparatus; Bertin's Tourmalins; Bohnenberger's Electroscope; Epinus's Condenser; Wheatstone's Rheostat; Wheatstone's Bridge; Cailletet's Apparatus, for liquifying the "incondensable gases;" Arago's Phosphoroscope; Bramah Press; Aneroid Barometer; Breguet metallic Therm; Hittorf's Apparatus, nonconduction of electricity in an absolute vacuum; Natterer's Tubes; Toepler Holtz Machine.

This comprehends only a small part of the apparatus already purchased; other articles have been ordered but not yet received.

LABORATORY EXTENSION.

The last Legislature appropriated $6,000 to enlarge the Chemical Laboratory. This sum was named from estimates made two years before by a skilled architect, but in consequence of the advance in the price of material and labor this sum was found to be insufficient to pay for the contemplated extension and finishing the same, and the first story of the new part still remains unfinished, and an additional appropriation of $1,450 is asked to complete and furnish this first story. These rooms are designed for work in quantitative chemical analysis, and for original research and experiment in Agricultural Chemistry.

The upper story is completed, and contains a beautiful lecture room with seating capacity for 150; the room is lighted by six large windows, and a skylight over the lecture table 6x10 feet, which affords abundance of light for lecture table and blackboards. Three large blackboards are mounted so as to be raised or lowered at pleasure. The room contains eight large ventilators;

is supplied with water and gas. An iron tank capable of holding 75 barrels receives the rain from the roof, and by pipes the water is conveyed to all parts of the building. The Professor's study adjoins the lecture-room, as also does the private laboratory. The instrument rooms for preserving the apparatus are in convenient proximity. The construction, location, and arrangement of these rooms have elicited expressions of high commendations from all who have examined them.

The old lecture-room has been converted into a very convenient analytic room, and equipped with tables and appliances for twenty students. We now have work room for 68 students in chemical analysis, and a lecture-room for 150 students. The opportunities for students in chemistry, as respects lecture-room and work-room in qualitative analysis, will be ample for many years to come.

The Chemical Department for the year has been in a prosperous condition, the students have been enthusiastic in their work, and general satisfaction has crowned the work of the year.

Respectfully submitted, R. C. KEDZIE,

Professor of Chemistry and Curator of the Chemical Museum.

LANSING, September, 1882.

REPORT OF THE ZOÖLOGICAL DEPARTMENT.

To the President:

I herewith submit my report for two years, 1880–81, 1881–82.

In the autumn term of each year I gave a course of lectures to the Senior class, on Zoölogy, illustrating the subject fully with living specimens, preserved specimens from the museum, and histological preparations. The course covered half of the term. The class in 1880 numbered 32, and that of 1881 numbered 28. During the remainder of the term I gave to the same class a course of lectures in Geology. In this work we used Dana's text-book. The subject was fully illustrated by use of specimens from the Lithological and Paleontological collections of the College Museum. While in the pursuit of this study the class each year, in company with myself, took the usual excursion to Grand Ledge, where the rocks could be studied in situ. I also gave a course of lectures during the last half of this term, each year, to the Junior class, on Human and Comparative Anatomy. The class of 1880 numbered 33, that of 1881 numbered 35. The lectures were illustrated by use of the manikin, several other models, and by several skeletons both human and of the lower animals.

During the spring term of each year I gave to the Junior class a full course of lectures on Human and Comparative Physiology. There were 34 in each class. In connection with the lectures there was laboratory practice for three hours each day. Each two students dissected a cat, studying the viscera; the subject was injected so as to show graphically the blood vessels, nervous system, and the muscles, and several of them dissected other animals, as sheep, calves, woodchucks, etc. The enthusiasm and accomplishment of every member of each class was such as to make the work exceedingly pleasant. In 1882, this term's work was done in the new building, and the superiority of the commodious laboratories over the old, crowded, ill-arranged class-room, for laboratory work, was well attested in the interest and progress of the students.

In the summer term of each year the usual course of lectures in Entomology was given to the members of the Junior class. The class of 1881 numbered 30, and that of 1882 numbered 32. This course embraces the anatomy and physiology of insects, systematic and economic entomology, and a full course of instruction in apiculture. In this latter each student not only sees the several manipulations necessary in successful apiculture, but each one actually handles the bees and personally performs the several manual operations. During the past year two students, one from England, came specially to study apiculture. Both have concluded to remain longer, and one to take the full course.

Owing to our large laboratories much more laboratory work was performed by the last class than was ever possible before. This practice was of very great benefit to the students. The dissections gave to each student a good idea of the morphology of bees and of a typical specimen of each order of insects. Each student in entomology studies more or less thoroughly the biology of some insect, and all make collections, some of which are very fine. One student made a fine collection of injurious insects, and gave it to the South Haven Pomological Society; and the class in 1881 made, with my aid, a fine collection of injurious insects, which was exhibited at the meeting of the American Horticultural Society, after which the collection was presented to the College. The students, without exception, manifested great interest in the study of entomology, and the progress made was very satisfactory.

One post graduate has spent considerable time in receiving private instruction, and in performing laboratory work in my department during the last year. Two High-school teachers have also received aid and worked in the laboratory.

HOURS OF TEACHING.

In the fall term I lecture one hour the first half of the term and two hours the second half. During the second half I give laboratory instruction two hours daily; in the spring term I lecture one hour daily, and give laboratory instruction three hours. During the summer term I give one lecture daily and laboratory instruction two hours each day. I have no assistant.

SUGGESTIONS.

There are two impediments in the way of the best work in my department. One—the lack of some knowledge of free hand-drawing on the part of the students—will no longer be felt. The other—some knowledge of the use and management of the compound microscope, such as is gained under the instruction of Dr. Beal later in the course—ought, in justice to the students, to be removed. Points in histology are constantly demanding consideration, which can only be given after some knowledge of microscopic manipulation. My time in each study is too short to permit the requisite instruction. The course of study ought to be changed so as to provide for this instruction in the use of the compound microscope as early as the first term of the Junior year.

COLLEGE WORK OUTSIDE OF THE CLASS ROOM.

During the two years I have given three public lectures at the College. The subject of one delivered in the spring term of 1881 was, "How to Preserve the Health. One was given in the fall term of the same year; subject, "The effect of Environment to Modify Structure." The third was delivered during the summer term of 1882, and the subject was "The Physiological Effects of the use of Tobacco and Alcohol." I have devoted all possible spare time to putting up and arranging specimens in the museum. During the two years we have received large and fine donations from the United States Fish Commission, which were sent through the courtesy of Prof. Spencer F. Baird, of the Smithsonian Institution. We have received a fine donation of insects of the order of Coleoptera from Mr. Henry Hubbard, of Detroit, and as many more insects by exchange. We have also received many other specimens through exchange and donation. During the past summer term I have supervised the moving of the general museum to the new building. The care and management of the museum has become no small burden, and takes no small part of my time. During the first four terms of the two years I superintended and taught in the College Sabbath-school, which is carried on under the general charge of the Young Men's Christian Association. I taught a class in the Sabbath-school during the following term.

EXPERIMENTS.

During the summer of 1881, I continued the experiments previously commenced to determine the value of the arsenites as a specific against the Codling moth. I also continued the experiments with bisulphide of carbon, which were begun the previous year. Careful experiments were also made with carbolic acid, and it was ascertained that it was very valuable. I also worked out some anatomical points regarding bees, which were before unknown. These researches were embodied in papers read before the Cincinnati meeting of the Association for the Advancement of Science, and published in its proceedings.

During the past season I have made careful experiments to determine the minimum amount of the arsenites—Paris green and London purple—which will be effectual in destroying insects, and the length of time the poisons remain on the plants, under different conditions of rain and drouth, in sufficient quantities to be effective. The results are of no small practical importance, and with the details of the experiments were given before the meeting of the Association for the Promotion of Agriculture at its late meeting at Montreal. I have also made investigations to determine the nature of the so-called "dry feces" of bees. I find that the nature of these pellets is entirely misunderstood by the persons who have given them consideration; that they are not feces at all, and that bees never void their feces in a dry state. The results and minutiæ of these experiments were given in my annual address as President of the North American Bee-keepers' Association at its last meeting held at Cincinnati. It is probable that both of these papers will appear in the next volume of the Report of the State Board of Agriculture. I have also made numerous experiments in hopes to find a practical method by which queens may be fertilized in confinement. Though I have not succeeded, I have had one queen that had her wing clipped as soon as she emerged from the cell, and which was confined to the hive, fertilized. This leads me to hope that this great desideratum may yet be realized. I have also experimented to determine the relation, if any, between the state of the weather and the amount of honey secretion. In this pursuit I have weighed a hive with bees each night after the bees were all in the hive, and so learned the gain or loss of honey. The results aro curious, and often inexplicable; but it will take years before we reach any conclusions that shall be reliable. I should like to experiment more, as there are many matters in apiculture and economic entomology that ought to be investigated; yet, with my lectures, laboratory work, care of the museum and of the apiary, and all without any responsible assistance, I have but little time and energy for such work.

THE APIARY.

In the winter of 1880-81, which was one of the most severe ever known to the bee-keepers of the country, one-half of our twelve colonies of bees were placed in the cellar and the remainder either packed in chaff or wintered in chaff hives. All of those in the cellar wintered well, while all left out died. Those wintered in the cellar did remarkably well the following summer, and the season's returns were very satisfactory. We nearly trippled our number of colonies, and received more than 100 pounds of honey to the colony. We found our Syrian bees very excellent and superior in every way, except that they are very cross, especially when queenless. In a paper read before the American Bee-keepers' Society at its meeting at Lexington, Ky., I gave a description of these bees, and explained their merits and demerits.

The winter of 1880-81 was very mild and bees wintered well. Our thirteen colonies, part in the cellar and part in chaff hives, all came from their winter quarters in fine condition. Those from the cellar, in which no colony ever has died, were set out April 7th. All of our bees were confined by a division-board so as to cover all of the frames, and all warmly covered at ends and on top with saw-dust pillows during the cold nights and days of spring, and all did very well. There was no trouble from "spring dwindling," nor could I see that those in chaff hives did better than did those in the common hives just from the cellar. The experience here at the College speaks loudly in favor of the cellar for wintering bees.

The season, during the early part, was too cold for nectar secretion, and so we got little honey during the white clover bloom. The storage from basswood was better, but, owing to the same cause, the yield was light. From the fall bloom the production has been very good. On the whole, the season has been about one-half of an average one. Our bees have always secured to us a profit of over 100 per cent on the value of the bees. The profit is rarely below 200 per cent.

Of our thirteen colonies, we sold five in the spring, have seventeen at the present time, and have taken over five hundred pounds of honey.

The coming winter I shall put most of the hives into the cellar, and the rest will be wintered on their summer stands in chaff hives. No pollen will be left in the hives, as it is not necessary, and its presence, by stimulating the bees to winter breeding, may do mischief.

SUGGESTIONS.

From our experience, recited above, with two students this year, who came to study apiculture, and several letters from others who desire to take the course in apiculture and entomology, it occurs to me that one or two notices of this course in the leading bee journals might add considerably to our numbers. I believe that a little advertising of this kind would be wise.

PRESENT CONDITION OF THE DEPARTMENT.

In the past year the department has made a very decided advance by its removal into its present admirable apartments, which occupy the entire upper story of the new library and museum building. All of that part of this floor east of the main hall is devoted to the general museum. This room is well lighted, not only from side windows, but also from above. The collections have been put into new cases, which are made upon the most recent and approved plans. The cases are almost air tight. Not only are the side walls mostly of glass, but the top of the cases are of the same material. The museum is lighted on three sides, yet cross partitions in the cases prevent any bad effects from interference of rays of light that come from opposite directions. This added room for purposes of exhibition enables us to fully display the large additions to our collections, received through the liberality of the Smithsonian Institution.

On the south end of the west side of the building is the lecture room. This is large, well proportioned, exceedingly well lighted, and is furnished with arm-rest seats, which rise successively as they recede from the front of the room. The blackboards and arrangements for displaying charts and diagrams are ample and commodious. All in all, this room leaves little to be desired.

Opposite the lecture room, on the north end, are two ample laboratories. These are exceedingly well lighted, and, as they face the north, afford excellent means for microscopic work. Eighteen students can work at one time with the microscope. Water pipes to and from these rooms and an elevator add materially to the convenience. Connecting the north laboratory and elevator with the exhibition room is a small but conveniently arranged work or unpacking room. Connecting the west laboratory with the lecture room is the professors' study. Every room opens into the hall. Convenient to the work room and laboratories is a pair of back stairs which lead out on the back side of the building. The elevator runs to the basement, where, at the extreme east end, shut off from the rest of the basement, is a room for cats and other animals kept for anatomical purposes.

At present the department is well equipped for laboratory work; the collections in the museum afford much aid in illustration and demonstration, the charts and diagrams, made specially for the purpose, are admirably adapted to make the subjects taught clear to the students, and the apiary, grain fields, meadows, orchards, gardens, and greenhouses furnish most ample means to illustrate economic entomology, and for experimentation in the same field.

NEEDS OF THE DEPARTMENT.

Perhaps the greatest need is a greater teaching force. Not that the number of hours which I teach are too much, but for a person to keep fully abreast with the latest discoveries and researches in such progressive sciences as those which I teach, and to undertake to teach anatomy, physiology, general zoölogy, entomology, and geology, especially with the large amount of other work which the department demands, is quite out of the question. It may not be practicable at present, but if the work could be divided between two persons, and more time given to experiments and to work among the farmers of the State, in which case there would be time to investigate any scientific matter that touched the interests of the agriculturists, it might be better for the State, the College, and the Department. I am often besought to give such practical matters personal attention, but in most cases can only say "no." The past year many such requests have been urged, and in most cases had to be denied. Could such aid be extended, it would not only please and benefit the practical men of the State, but the wider knowledge gained by the one making the investigations would greatly aid the students.

A second need is more specimens in the museum. Our very short courses in general zoölogy and geology, which should certainly be lengthened as soon as a way can be found to do it, make it most desirable that the means of illustration in these branches be as complete as possible. In geology we ought to have the service of Ward's casts and many more fossils. Our present models serve an excellent purpose and should be increased. The Michigan fauna should be represented by a complete list of preserved specimens. From the important place that entomology holds in our course, and from its importance as one of the most practical of the sciences, we should have a full collection of the insects of the whole country.

It is also suggested by many of the leading bee-keepers of the State that our apiary be extended so as to fully occupy the time of one man. The apiary now affords means to illustrate all the various operations necessary in bee-keeping. It is urged, however, that many experiments that could be best made here can only be made in large apiaries. There is force in the argument, and when we remember that such a change would not add any expense, but would make the apiary a source of much greater profit than at present, we may well give the suggestion thoughtful consideration.

OUTSIDE WORK.

In the summer of 1881, I attended the Cincinnati meeting of the Association for the Advancement of Science, and presented two papers, the results of my experimental work at the College. These are both published in the proceedings of that society. Immediately after I spent a week in Central Ohio collecting insects, and added several hundred species, new to our collections. One year ago last winter I went to Vassar to aid the local committee in arranging for the Institute afterwardheld at that place. I gave two addresses at this Institute and one at the Oxford Institute, in Oakland county. I also attended the annual or winter meeting of the State Horticultural Society at Ann Arbor, where I read a paper, also the annual meeting of the State Bee-keepers' Society, where I gave an address. I was elected President of this last named association.

During the past summer I attended the meeting of the Society for the Promotion of Agricultural Science at Montreal, where I read two papers. I also attended the meeting of the American Association for the Advancement of Science at the same place. I have also attended the State and National Bee-keepers' associations, the former at Battle Creek, the latter at Lexington, Ky. I was President of both associations, and gave an address at both meetings, as required by the constitutions of the associations. These addresses were the results of the investigations which were made at the College. I also attended the winter meeting of the State Pomological Society at South Haven, where I delivered an address on "Practical Entomology," which is published in the report of the society. I have also attended, read a paper, and taken a part in the discussions at the two meetings of the Central Michigan Bee-keepers' Association. I also prepared two lectures which I was employed to give before farmers' meetings in Ohio. In December I spoke before three institutes in Northern Ohio, and addressed a joint meeting of the State Board of Agriculture and the Legislature in the Capitol at Columbus. I am urged to do the same thing in that State this winter. In the winter I spent six weeks in the study of microscopy at Cornell University. The advantage of this study in the laboratories of such able professors as are Messrs. Wilder and Gage were great indeed. The attention which I received at Cornell was such as to win and receive my deepest gratitude. Owing to my work at Cornell, I was unable to attend the farmers' institutes in Michigan, from which I was kindly excused by the State Board of Agriculture.

During the year I have written occasional articles for the *American Agriculturist*, the *Rural New Yorker*, and the New York *Tribune*, mostly in response to inquiries. I am also one of the editors of the entomological magazine, named *Psyche*, published at Cambridge. Respectfully submitted.

A. J. COOK.

REPORT OF THE PROFESSOR OF BOTANY AND HORTICULTURE.

To the President:

I herewith present my report for the two years now closing September 30th, 1882.

BOTANY.

During one term of the academic year beginning September, 1880, 67 names were enrolled for beginning this study, and 34 for pursuing physiological botany; total of those pursuing botany during that year, 101.

During the next academic year, beginning September, 1881, 48 students pursued systematic botany, 54 began botany, and 27 pursued physiological botany, a total of 129 in the study of botany during the past year.

The mode of pursuing the study was fully described in my previous report. In physiological botany each student prepares his own sections and slides and makes his notes and drawings.

During the past two years seven students, several of whom were resident graduates, have received extra instruction in botany. Most of them have studied grasses and physiological botany. It is the intention to exhibit at the coming meeting of the State Teachers' Association essays of the freshmen on botany and the notes and drawings of the seniors in physiological botany.

LANDSCAPE GARDENING.

During the last half of the summer term of the academic year beginning September, 1880, lectures were given to the seniors, 32 in number; during a half of the autumn term previous lectures were given to 49 sophomores; during the half of the summer term of 1882 lectures were given to 27 seniors.

HORTICULTURE.

The indoor instruction in horticulture during the autumn term of 1880 was given by daily lectures to 38 juniors, and during the autumn term of 1881 to 33 juniors.

THE WHOLE NUMBER

of students in my classes for the year beginning September, 1880, was 171, and for the year beginning in the fall of 1881 the whole number was 241, a total of 412 during the two years. Some of these names were enrolled twice or more in successive terms or classes.

FARMERS' INSTITUTES.

These are highly appreciated by the farmers. Some persons suppose that attending a few institutes is the chief work of the professors during the long winter vacation. In case of the Professor of Botany and Horticulture, at least, this will be seen to be an error by observing the following outside work done for the people:

QUESTIONS ASKED.

During all times of the year letters are sent in making inquiries about a great variety of subjects. Letters have been sent from fifty (50) persons asking the names of as many dried plants. Some of the plants are grasses, some are weeds, some are valuable for bees. To name some of these, especially when the specimens were in poor condition, sometimes required from one to two hours of hard study. Omitting the name and the State, the following inquiries have been made: "The quality and value of Russian apples?" "Give a select list of apples." "About upland cranberries." "The Weaver plum?" "Pears on foreign stock, how affected by blight?" "Tree swindlers?" "Strawberries without runners?" "Will wheat turn to chess?" "Plan and suggestions for a botanical laboratory." "About a programme for an association of agricultural societies?" "Suggest topics to be discussed by county agricultural societies." "Name 18 sorts of apples for a neighbor." "Give your opinion about a new grape" (samples sent by two different men). "Make suggestions for conducting a State experimental station" (two inquiries from different sources). "Will red clover die because it headed out the first year?" "Where can I see an incubator? Is the one figured in Ure's Dictionary up to time?" "When, how, where, and who introduced the Canada thistle, or is it a native?" "Reply to an article in a paper finding fault with the Agricultural College." "A retired teacher in Illinois is going to farming and asks about grasses for western Iowa." "A college wants a man to run a greenhouse." "Inquiries about White Globe onions" (three letters). "What are the best trees for screens?" "List of best ornamental trees and shrubs?" "Advice about the nursery business." "Is Danthonia spicata a good lawn grass?" "What are the best potatoes to raise in Montana?" "What is the beetle which eats my apple tree limbs?" "Advice about seed corn." "Use of coal-tar for fence posts?" "How does the Worden grape thrive with you?" "How to manage 40 acres of light land? How will onions do? The best fertilizer, ashes, plaster, or lime? How much? Keeping poultry? The best breed?" "Your opinion about barbed wire fence?" "Cost of attending college, terms, etc.?" (asked by an editor). "Who sell Holstein cattle?" "How will honey locust do for a hedge?" "When to cut maple timber to not be troubled with borers?" "How would alfalfa and orchard grass thrive on Long Island, New York?" "How about fruit prospects?" (asked by half-a-dozen editors). "What are your laws about insect foes?" "What is smut in Indian corn, and a remedy?" "A good rule for making grafting wax?" "What is this new cherry growing on my farm?"

"What is the cause and remedy of grape rot?" "Of pear blight?" "Of the yellows?" "What are the names of the best scientific periodicals, and the price?" "The title of the best treatise on grasses?" "I want a collection of all of your grasses for a fine grange hall?" "What is the best microscope for me to get?" (several letters). "How can I improve my Indian corn?" "Will early and late corn mix?" "How far apart will corn mix?" "What is this monstrosity of a flower which I send you?" "How to preserve fence posts?" "How to grow seedling strawberries?" "What do you think of Shoemaker wheat?" "Is wheat close fertilized?" "Please check off a list of desirable trees and shrubs." "Name, please, 100 kinds of wood." "What do you think? Is there a demand where I live for an agent to sell first-class ornamental trees?" "Can you recommend a first-class teacher of agriculture?" "I send you some worms found in my well in New York State?" "Please name a good club-bearded wheat." "Please name these galls on a grape leaf." "What is this fungus on the quince, and a remedy?" "I want nformation about growing timber, especially black walnut." A professor asks about courses of study and student labor. "How to plant chestnuts?" "What about these tree dealers in Ohio who sell apple trees and peach trees at five dollars apiece?" "What do you think of the White Ann Arbor grape?" "Can you recommend a good Professor in Botany to begin on a low salary?" "What grass should I buy and where shall I get the seed for my dry lawn in Texas?" "I have improved Indian corn by saving seeds from the tassels. What do you think of it?" "How to prepare ground for seeds of red cedar?" "Please give a plan, with list of trees and plants, for improving our school grounds?" "Please make out a list of pears for market?" "How to raise seedling evergreens?" "What white onions keep best?" "Tell me about alfalfa." "Tell me about your appropriations for horticultural department." Another asks all about "your appropriations in agricultural department." "What is the best grass for a marsh?" (several inquiries). "Will acorns live many years in the ground; will oaks come without seeds; do fish die in the ocean? How about weeds which come up about newly dug wells—weeds unlike any others in the country?" "What is the relative nutritive value of white and yellow corn?" "I want to learn how seeds deteriorate." "I want help to write an essay on the topic last named." "What is the title of a good book on hybridizing flowers?" "What is the matter and remedy for these peach branches sent you?" "Please give me names of persons to collect timber for a museum." "What ails this twig of pine on which the ends of the leaves are dead?" (two inquiries—one from Illinois and one from Wisconsin). "Can you explain this head of wheat with chess growing out of it?" (three or four specimens sent by as many men. The specimens were all examined, explained, and returned to the senders.) An editor inquires about a new grass and a tree bean. "When to trim evergreens?" "Have you an idea that all the plants now on the earth were created at the Adamic creation, or have some of them been brought forth later?" "Do you believe it possible for any mixture of soils or elements to produce any plant, as rag-weed, for example?" These questions came from 18 or 20 different States, including Texas, California, Canada, Massachusetts.

PUBLIC LECTURES.

The writer is not a good speaker, especially to companies in the open air. He has refused numerous requests in this State and in other States to address granges, institutes, and county fairs. He has generally declined. He has agreed to help the Lecture Bureau of the Patrons of Husbandry in a short course of lectures in some other States during this winter.

WRITING FOR THE PRESS.

Most of the numerous requests for articles have been declined during the past two years.

THE PATRONS OF HUSBANDRY.

For one of the past two years I acted as lecturer to Capital Grange, which meets weekly in Lansing. The membership has been from 250 to 275. During the same time I acted as Master of the County Grange, which held about ten meetings in a year in various parts of the county.

I attended the last meeting of the State Grange, where I was a delegate and Chairman of the Committee on Education. I assisted in making preparations for the State Grange picnic held the past summer.

THE STATE AND COUNTY HORTICULTURAL SOCIETIES.

For two years I have been President of the Ingham County Society, which meets once a month. I attend about two meetings of the State Society each year, where I always present one or more papers.

THE STATE TEACHERS' ASSOCIATION.

At the meeting in 1880 I read a paper on "Methods of Teaching Botany." This has been issued in a second edition by C. H. Marot of Philadelphia. At the last meeting I was elected President.

THE AMERICAN POMOLOGICAL SOCIETY.

The 18th biennial session was held in 1881 at Boston, Mass. I was appointed by Governor Jerome as one of the Commissioners to use a State appropriation in making an exhibit of Michigan fruits at that meeting. While attending the meeting I read a paper on the "Classification of Pears by their Flowers," and was elected Secretary. In filling this office I last winter edited a quarto volume of about 230 pages as the proceedings of the society.

THE NATIONAL FORESTRY CONGRESS.

I sent a paper which was read at the Cincinnati meeting the past summer. I was prevented from attending the Montreal meeting on account of an engagement with another society meeting during the same days.

THE SOCIETY FOR THE PROMOTION OF AGRICULTURAL SCIENCE.

This national society has held three annual meetings, at all of which I acted as President. At the meetings of 1881 and 1882, I presented papers on "Testing Seeds" and "On the Variation of Red Clover." I am now engaged in editing the proceedings of these two meetings.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

I attended the last two meetings held at Cincinnati, Ohio, and in Montreal and read a paper at each meeting. At the last meeting I was elected a Vice, president, or President of Section F—Biology.

FACILITIES FOR THE STUDY OF BOTANY.

You, the President of the College, requested a few paragraphs on this topic. In my estimation, the main thing is a live, capable teacher who has not too many other things to attend to. The College has a large laboratory built expressly for the study of botany. The second story, with a gallery all around, contains a good beginning for a museum of vegetable products. The laboratory and class room are amply lighted in a way that the light can be much modified or controlled by numerous window curtains, which can be lowered from the top or raised from the bottom. The laboratory is convenient and large enough, and is furnished with 28 compound microscopes, each costing from 30 to 150 dollars. There is quite a variety of accessory apparatus for preparing and mounting slides and making experiments. The arboretum of 150 species, the botanic garden of about 800, the greenhouse with some 1,200 species and varieties, the plats of grasses and clovers, the trees and shrubs on the College lawn and the wild plants left along the river, the orchards, vineyards, and vegetable garden, altogether give us about 2,000 specees of living plants, many of which are labeled. Add to this the Cooley herbarium and that of my own, and note the fact that our classes continue the study during a large part of the summer months, and one can see that the materials and apparatus for the study of botany at this College are quite ample and much more extensive than are usually found in colleges.

Since moving into the laboratory I have always had some special students, among them some graduates of this and other colleges. There is plenty of room, material, and apparatus, and they are always welcome.

We need some means to sustain and keep the arboretum, botanic garden, museum, apparatus, and herbarium all growing.

The equipments of the botanical department have been largely increased during the past few years. They should always progress to keep up with the times, but will never arrive at perfection.

Dr. J. T. Rothrock, a graduate of botany at Harvard under Dr. Gray, is now Professor of Botany in the University of Pennsylvania. Last year he visited the best European laboratories and gave an account of his visit in the *Botanical Gazette* for April, 1881.

He adds that "the laboratories of Harvard, Michigan (two), and Iowa have taken the initiative in introducing needed reforms, and already a most promising crop of fruit is the result. First of all, by indoctrinating them with the idea that they will make the most substantial mental gains if they study each individual plant exhaustively. It is the idea the student should be saturated with through and through. It is the foundation of his foundation, and makes critical investigation press upon him with the weight of an ever-present duty."

LIST OF SOME OF THE PAPERS AND EXPERIMENTS FROM 1870 TO 1880.

As the College is now 25 years old, you request a summary of the work done by me since my connection with the institution in 1870.

The Report of the State Board of Agriculture.

This has generally been printed annually. The report for 1871 contains "Grasses for the Dairy," a lecture given at Elgin, Illinois, before the State Dairymen's Association. A similar lecture was soon after given at Adrian before the State Dairymen's Association of Michigan.

1873. This contains my first report as Professor of Botany and Horticulture, and includes a plan of experiments begun in the apple orchard in cultivating the trees in various ways; various modes of catching codling moths, crossing apple blossoms, begin the arboretum, and plats of grasses, clovers, and the like; exhibit labeled bunches of 120 species of grasses at the State fair.

1874. This report contains the results of experiments on apples infested with worms; the length of roots of fruit trees. A new greenhouse of four rooms was built, costing about $9,000; rustic bridges, arbors, and summer houses built; zinc labels placed on trees or labels of wood in the ground for trees on the lawns and in the orchards; cross-fertilize apple blossoms; raise 800 new seedling potatoes; measure length of roots of corn, parsnips, clover, grass; hybridize wild and cultivated crab apples; raise 500 seedling grapes, some new seedlings of pears, cherries, quinces; 800 new raspberries; 1,000 or more new strawberries; 150 new currants; 300 new gooseberries; try protecting peach trees by burying and by litter; test named varieties of potatoes.

1875. This contains a plan of student's work; start samples of 20 different kinds of hedges; exhibit bunches of grasses and 60 named sorts of living plants of weeds at the State fair, also a banana in fruit; introduce a plan for teaching horticulture in small classes in the orchards and gardens. My report this year was issued in bulletins and printed wholly or in part in about 130 different newspapers; experiments on killing weeds; notes on improving onions; experiments with many sorts of potatoes; raise more new gooseberries, raspberries, grapes; collect timber for a State exhibit at the Centennial, for which the College receives a diploma for "magnificent collection of forest woods;" send 250 named sorts of potatoes to the Centennial and receive a diploma; also 120 labeled bunches of prominent grasses, about which the official report says: "The collection of dried grasses was the most extensive in the Agricultural department and perfect in nomenclature." The report also contains my account of the best mode of killing quack grass; management of compost heaps and dry earth closets; crossing tomatoes; testing 41 sorts of Japan vegetables; urge the Board of Agriculture to establish farmers' institutes; lecture at Institute on "Grasses" and on "Pruning Apple Trees;" lecture at State Teachers' Association and twice for County Teachers' Association.

1876. In this I report in detail the results of experiments in the apple orchard; experiments on thinning apples; use of lime, plaster, sour milk, vinegar, etc., to cattle or drive off codling moths; will potatoes run out? raise more new varieties; start a new pear orchard; lecture at three farmers' clubs, twenty-five granges, and some more than once; three literary societies, one high school, four farmers' institutes; paper on the farmer's garden; lecture at farmers' institutes on "The Apple Orchard" and on "Horticultural Experiments."

1877. Account of experiments for several years to determine the value of bumble bees in fertilizing red clover; cross flowers of wheat; begin to improve a sort of Indian corn; test root pruning; study the flowering of timothy; experiment on the food of moles, and with many sorts of potatoes; test tomatoes for earliness and value; lecture at four farmers' institutes on "Starting an Apple Orchard" and on "Testing Seeds," especially seeds sold in small packages at the groceries, and seeds of grasses and clovers.

1878. This year the report notices lecture at four farmers' institutes on "Improving Grains, Fruits, and Vegetables." This lecture includes a report of some experiments made for the first time in this country on the plan of

Charles Darwin on "Crossing with Foreign Stock." A part of it was printed in the *American Journal of Science and Arts*, and Dr. Gray writes: "The experiments are very neat and to the purpose." I planted 75 varieties of Indian corn, 20 of onions, 250 of potatoes; continue many orchard experiments, try to change the bearing year of apple trees; enlarge the arboretum; graft potatoes on tomatoes and artichokes on sunflowers for a purpose; cross tomatoes, gooseberries; hybridize raspberries; root prune corn; try to see if pollen affects all corn the first year; try to hybridize red and alsike clover; try to feed the leaves of tomatoes, petunias, and martynias with soup; test many sorts of vegetable seeds sold by best dealers; start a botanic garden; write for the report a popular account of the trees on the College grounds.

1879. In this volume is a report of three lectures at farmers' institutes on "Experiments Made at the College." This includes something in reference to the growth of the trees in the arboretum; burying in bottles over 20 sorts of seeds to be taken up years hence to test their vitality; burying sticks of 13 kinds of timber in two places to see if it is best to set posts "top end down;" test vitality of buggy peas; test value of bumble bees in fertilizing red clover; observations on the time of blossoming of Indian corn; test the vitality of pollen one year old; try various sorts of bands to catch codling moths. The report is complimented by the *Country Gentleman* as "containing, as usual, a large amount of interesting practical matter." The Botanical laboratory is built, costing about $6,500.

1880. This gives an account of some results of experiments in different modes of cultivating apple trees. A lecture on Indian corn was given at three farmers' institutes.

Reports of the Michigan State Horticultural (Pomological) Society.

These have been made annually since 1871, and each contains the results of four meetings held each year in various parts of the State.

1871. This is volume one and contains some account of my study of the peach yellows.

1872. This contains an address on "The structure and uses of roots."

1873. This contains "The value of an arboretum," "Fertilization of flowers," "Describing varieties of apples by the flowers; something new," "Report of the Orchard Committee," W. J. Beal, chairman. We spent thirty days viewing the best places.

1874. This reports the lectures at two meetings on "Fungi" and "How Plants Grow."

1875. This gives a lecture on "Forest Products at the Centennial;" papers on "Cultivating orchards," "Improving onions," "Will potatoes mix in the hill?" "Plant evergreens."

1876. This includes papers as follows: "Classification of apples." This is the great need of pomology. "Mutual benefits of insects and plants." This was a lecture given at the State Bee-keepers' Convention. "The new pear orchard at the College," "100 books on horticulture," "Preparations for the garden."

1877. This has a lecture on "Horticultural experiments;" "Native trees and shrubs," "Reports on apples shown at Pontiac," "Methods of exhibiting fruits," "Report of the Orchard Committee," W. J. Beal, chairman. We spent twenty-five days in examinations. J. J. Thomas, in the *Country Gentleman*, says: "We rarely find one so closely packed with information."

A paper on "Thinning fruit," "Moles as vegetable eaters," "Darwin's new book."

1878. This has lectures or papers on "Cross-breeding plants," "Experiments and teaching horticulture at the College," "Shall we begin to grow plantations of trees for timber?" "Rules for judging apples," "Report as judge of apples at State fair," "Distance for planting apple trees," "Remedies for codling moths," "Materials for mulching," "The farmer's front yard," "Taking notes and making plans for a garden," "List of 25 best deciduous trees and 25 best shrubs, with remarks," "Spruces at the College," "List of evergreens."

1879. This has papers on "Acclimation of plants," "Lawn making," "Testing varieties," "Embellishing school grounds," "Pruning evergreens," "Describing apples by flowers," "Sweet and sour apple—'so-called.'"

1880. This contains a lecture, "The oaks of Michigan and the world," "Crossing flowers," and other papers.

1881. This gives an address on "What can botany do for horticulture?" "Irrigation," "Rural cemeteries," "Highway planting," "Beginning botany."

The American Pomological Society.

This society meets once in two years.

1875. This year I took an exhibit of apples to the Chicago meeting.

1877. This report contains a paper on "Classification of apples" for the meeting in Baltimore, Maryland.

1879. This has a paper presented at the meeting in Rochester, New York, on "The distinguishing of the varieties of apples by the flowers."

1881. I present a paper at the Boston meeting on "Distinguishing pears by the flowers." I was appointed by the Governor one of the Commissioners to make an exhibit of fruit for the State. I was elected Secretary of the society.

The American Naturalist.

This scientific magazine was started in 1868. I contributed to the first volume, and to nearly every volume since that one. Among the articles contributed were two on "Agency of insects in fertilizing plants," "Plants on the beach of Lake Michigan," "Climbing plants," "Inequilateral leaves," "Phyllotaxis of cones," "Carnivorous plants," "Æstivation," "Hairs and glandular hairs," "How thistles spin," "Distinguishing populus and juglans by buds," and many short notes.

The American Association for the Advancement of Science.

Previous to the work done at the last two meetings, noticed elsewhere, I contributed one paper at the Indianapolis meeting, three at the Detroit meeting, two at the Buffalo meeting, two at the Boston meeting.

Miscellaneous Contributions.

In 1880, I lectured on "Agricultural Education" before the Connecticut State Board of Agriculture. The lecture was printed in their report and copied in the Report of the Ohio State Board of Agriculture.

I have written articles, long or short, much too numerous to mention, for the *Michigan Farmer*, *Prairie Farmer*, *Scientific Farmer*, *Farmer's Review*, *Country Gentleman*, *New York Tribune*, *Gardener's Monthly*, *Land and Home*, *Post and Tribune, Free Press, American Annual of Rural Affairs, Rural New Yorker, American Agriculturist,* several bee journals, and many other journals and papers. I have occasionally written some articles for the following English journals, or articles have been copied by them: *Science Gossip, Nature, Garden, Gardener's Chronicle.* I have given several lectures and papers at annual meetings of the State Teachers' Association; have written several articles for the *Illinois Teacher, Michigan Teacher, Michigan School Moderator.*

TESTING SEEDS.*

The first station for testing seeds was established by Dr. Knobbe, of Saxony, in 1869, only thirteen years ago. A little has been done in the same direction in several of the States within the past few years. Probably more has been done at this College than at any other place in this country. We began in the spring of 1877, and have given more or less attention to the subject ever since.

In Saxony, adulterations of seeds were discovered, "most ingenious in character, harmful in effect, and remarkable in amount." Various countries of Europe, including Great Britain, have enacted stringent laws to regulate the sale of seeds and punish men who adulterated seeds in any way.

The more the subject was investigated the worse it looked and the more widespread it appeared to be.

One practice was to kill seeds by boiling or baking. These were of some plant allied to the valuable one; for example, seeds of charlock, which are worthless, were killed and assorted with sieves. The large ones were mixed with rutabagas, the small ones with turnips. In such cases, all the seeds which grow are good, but those of dead adulterations will not tell any tales. The purchaser is deceived in the quantity he buys and in the amount of good seeds sown on a given space.

Old seeds, or seeds of another variety, are often dyed and used to adulterate good seeds of red clover or some other species. Sulphur-smoking is frequently resorted to, to renovate the appearance of worthless old grass seeds. Some seeds are dressed with oil for a similar purpose. Experts are carrying on a regular business in doctoring seeds.

The seeds formerly sold, even by the very best seedsmen, were more or less tampered with. Seedsmen were careful to adulterate their seeds about so much each year. If they did not, troublesome questions were likely to be asked.

In Germany mills were engaged to grind up quartz, sift it, and color it to resemble seeds of red clover, with which it was mixed. In 1869 it is estimated that 20,000 bushels of poor turnip seed was sown mixed with good seed. There was, and perhaps it still exists in England, an organized agreement among seedsmen to adulterate seeds to just such an extent. Pure, fresh seeds they quote as "net seed," while dead seed they quote as *trio* or "000." Cauliflower, in some cases, they agree to adulterate 40 to 50 per cent.

It cannot be expected that our Yankee seedsmen would remain very long behind our European friends in selling poor seeds. As a people, we do not like to be outdone. Many seeds are imported and sold in this country. Some are adulterated before they come here. Perhaps some of our seedsmen have learned to adulterate seeds. I do not know. We know that all of the large dealers who have the best reputation sell some poor seeds—some seeds which are absolutely worthless.

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* Some portions of this chapter on testing seeds were used in articles presented at two meetings of the Society for the Promotion of Agricultural Science.

In 1877, I began by testing the seeds which were sold on commission by grocerymen all over our State. They were found very poor and unreliable. The results were published. At least three of the worst firms went out of the business soon after or ceased to sell seeds in our State. The seeds still sold at our grocery stores in small packets are many of them unreliable, and if unreliable are worthless. I find the greatest fraud exists in grass seeds, many of which are imported. Seeds of the commonest grasses, as timothy, orchard grass, June grass, red top, are generally very good, but seeds of perennial rye grass, the fescues, meadow foxtail, oat grass, crested dog's tail, sweet vernal, and others are very low in vitality, almost without exception. In some lots tested by me there were no seeds which would germinate. Grass seeds are not known by many persons. At one time a good dealer sent empty chaff of Burmuda grass, which often flowers, but seldom seeds; at another time he sent samples of red top, or something like it, which had apparently been cooked. The seeds were all rotten. Even the Agricultural Department at Washington has sent out many very poor seeds.

The great importance of testing seeds to ascertain their vitality, purity, identity, freedom from foreign substances, has already been clearly demonstrated by the efforts of many persons. This is true of seeds which are home grown, and especially true of seeds which are obtained by purchase. In America the subject can hardly yet be said to have been fairly started. People are just beginning to think of the subject, but have done very little. Once decided that it is important to test seeds, the next step is, "How shall they be tested?"

In making tests, the fact must not be lost sight of that the finest looking seeds, and those which show the greatest proportion of living seeds, may not be the most desirable for the field or garden. Much depends on the variety, the choicest strains of some kinds producing seeds of inferior appearance and vitality. One of the objects of the following experiments is to consider some of the points in regard to the best modes of finding the vitality of a few kinds of seeds.

In several countries of Europe this part of the subject has commanded much attention, and as one of the results several kinds of apparatus have been manufactured and put on the market. I have had the privilege of using but one kind of this apparatus. That one is the plates for testing seeds manufactured by E. H. Krelage & Son, Haarlem, Holland. The plates are made of fine potter's clay, and are fifteen centimeters in diameter, or nearly six inches. These plates are of two sorts, one containing twenty-four numbered pits or depressions; the other, five large depressions.

To get the highest per cent to germinate, we have concluded that particular modes of testing must be employed for the seeds of certain species, gendera, or families. In a number of cases where the seeds possessed a low vitality it has been found by others that certain chemical substances increased the per cent which would germinate. I have not employed any of these.

To hit upon the best method in a certain case, as that of wheat, we need a quantity of seed which has been well grown, carefully harvested, and is known not to have been subjected to severe trials or long exposure to great extremes of drought and moisture, heat and cold. This reliable seed wheat can be tested by some of the best known methods, and if found to be of prime vitality, it can be used side by side in the different methods employed for testing other lots whose history is unknown.

In these modes, attention must be given to all the details of moisture, air, and temperature; the manner of selecting an even lot of seeds; the quantity of each to be used, and perhaps other matters which are not here mentioned.

In German stations "The kind of work done is chiefly the following:—Determination of the genuineness of gendera or species; the total amount of impurities; the nature of the impurities and their respective amounts; the germinating power of seeds; the absolute weight of seeds; their specific gravity; their weight per bushel; detection of sophistications, such as dyeing, bleaching, oiling, etc." [Transactions of Highland Agrl. Soc., p. 288, 1878.] To aid in carrying on this work, they need collections of genuine seeds of the varieties, known to be pure; they need seeds of weeds accurately identified. They need sieves of various grades, bellows, forceps, delicate scales, thermometers, jars, test-plates, chemical tests, and other apparatus. The stations for testing seeds in Europe are kept up by enterprising farmers, aided by the government.

In the spring of 1881, I procured from a mill in Lansing some white wheat of good quality. Nothing was known of its age or history. On May 19th, ten lots of 100 kernels each were tested, as follows: All the kernels which had a suspicious look were rejected. The temperature of the botanical laboratory where they were tested ranged from 60° to 80°, Fahrenheit. Small glazed saucers were one-third full of wet sand. The dry wheat was placed on the sand, which was covered with thick carpet-paper, soaking wet. Over all was a board with a little chance for air. A little water was added, as the seeds seemed to need it. After a time the papers moulded some, and the roots of the wheat penetrated the papers. The dryest looking lots did the best.

After six days, the result showed, that out of ten lots of 100 each, the following numbers had sprouted: 81, 82, 84, 85, 85, 87, 89, 89, 90, 96—an average of 86.8 per cent.

On May 23d, in the same room, with the same apparatus used in a similar manner, the same quantity of the same lot of seeds were tested with the following results: 56, 75, 75, 76, 77, 78, 78, 79, 82, 89, out of each 100 germinated, averaging 76.5 per cent. Here is a difference in the results of 10 3-10 per cent, for which I cannot account.

On July 23d, was tested some hand-picked red wheat of first-rate quality. It was shelled by hand, and not quite dry enough to grind well. In glazed dishes, between wet folds of heavy carpet paper, were placed two lots of 100 kernels each. The paper was kept moist till August first, when the seeds were counted with the following results: 100, 100, 100, 100; an average of 100 per cent in germination.

On August 2d, wheat soaked 12 hours in water was placed in test plates in the tropical room of the green-house as follows: The temperature ranged from about 80° to 100° F. In four days, 116, and 116 out of 150, and 150 kernels of the Ingersoll wheat germinated—about 77 per cent; 150 and 150 kernels of fresh red college wheat germinated out of 150 and 150 kernels, or 100 per cent.

On August 2d, sauce dishes kept damp were placed in a vacant room in the green house, where in the day time the heat ran up to 130°-136° F. Out of two lots of 100 kernels each of Ingersoll wheat, 50 and 65 germinated,—57-5 per cent; and 100 per cent of two lots of 100 kernels each of fresh college wheat germinated.

On August 2d, wheat was tested in the botanical laboratory as follows: The temperature during the day, for a part of the time, was 94° to 98° F., and all the time very warm.

Wheat was tested in covered, porous saucers set in plates of water. Of three lots of Ingersoll wheat, of 100, 100, 100 kernels, 36, 40, and 40 grains germinated; or nearly 39 per cent.

Three lots of fresh College wheat of 100, 100, 100 kernels, were treated in the same manner. Of these 100, 100, 99 germinated, or 99.7+ per cent.

In another saucer were 150 kernels of Ingersoll wheat, which gave 106 in germination, or about 71 per cent; and in another saucer were 150 kernels of fresh college wheat, which gave 149 in germination, or 99.5 per cent. The lots of Ingersoll wheat became very mouldy, and sprouted much the soonest, as they were white wheat; while the college wheat was red.

On August 2d, in very dry and hot weather, 1,000 kernels of Ingersoll wheat, first 12 hours in water, were planted 1½ inches deep in sandy soil in the garden. The bed was well watered twice and covered with boards. In three days it rained and became much cooler. In a few days these were examined, and 77, 73, 66, 69, 76, 76, 71, 65, 76, 69 had germinated, averaging 71.8 per cent. At the same time and place, and in the same manner, 1,000 kernels of fresh college wheat were sown in lots of 100 each, and gave 95, 93, 98, 98, 96, 90, 94, 96, 95, 94, averaging 94.9 per cent. This new red wheat was always slower in starting than the old white wheat. Some kernels were not found.

What are all these figures worth? Perhaps not very much, but we are quite safe in drawing some conclusions while the experiments point to still other conclusions with some degree of probability.

1. When tested in different manners or at different temperatures, or even side by side in the same manner, at the same time, wheat with low test, or low vitality, varies much more in its germinating power than good, fresh wheat, with good vitality. In other words, good seeds have the most endurance. They will stand the greatest abuse.

2. White wheat germinates quicker than red wheat.

Prof. W. W. Tracy, and perhaps others, have found great variation in the results where they had tested many lots taken from the same packages of seeds of cucurbitaceæ.

Some seeds of Turban squash, tested in two different ways by Prof. Tracy, experimenter for D. M. Ferry's seed company, were found to contain 50 per cent of living seed. I tested 20 seeds in damp sand in the green house, with a temperature of about 70 degrees; 20 others were soaked twelve hours in water, and then placed between the folds of thick paper kept wet; 20 others in wet paper without being previously soaked in water. Of the first lot 45 per cent germinated; of the second lot 55 per cent; of the third lot 35 per cent.

On June 9th, 25 seeds of each of four lots of pumpkin seeds were placed on sand in dishes covered with thick wet paper, at a temperature of 70 to 80 degrees.

Home grown seeds of 1880, grown near Adrian, gave	100 per cent of living seeds.
Seeds from Peter Henderson & Co	72 per cent.
Gashaw(?)	44 per cent.
College garden	96 per cent.

Seeds of D. M. Ferry's pumpkins and squashes were purchased at a grocery in Lansing.

On June 8th, a board frame was set in sandy soil, in which were planted 250 pumpkin seeds and 200 seeds of Hubbard squash.

Of the pumpkins, 180 or	72 per cent grew.
Of the squashes, 146 or	73 per cent grew.

Of the same seeds, 100 pumpkins and 100 squashes were planted in sand with a box having a glass cover. The experiment failed on account of the interference of mice.

At the same time 80 seeds of pumpkins and 80 seeds of squashes were planted in sand in the greenhouse, at a temperature of 60° to 80° F.

Of the pumpkins 36, or .... 45 per cent grew.
Of the squashes, 33 or .... 41+ per cent grew.

On June 17, after a heavy rain, with the thermometer at 80° Fahrenheit, I sowed in a sand bed in the garden 200 seeds of the same lot of pumpkins and 200 seeds of squashes.

Of these pumpkins, 102 or .... 51 per cent grew.
Of the squashes, 107 or .... 53+ per cent grew.

SUMMARY

of testing this lot of seeds of Hubbard squash:

In the garden, 1st test	73 per cent.
In " " 2d test, after rain	53 per cent.
In the greenhouse	41 per cent.

SUMMARY

of testing the above lot of pumpkin seeds:

In the garden, 1st test	72 per cent.
In " " 2d test	51 per cent.
In the greenhouse	45 per cent.

We can hardly fail to draw the conclusion that some of the modes of testing were at fault, as the results of testing pumpkins and squashes run quite parallel. Some seeds were presented by D. M. Ferry & Co. with a view to testing; among them were seeds of Boston marrow squash and Marblehead squash. On July 23d, in hot weather, 200 seeds of turban and 200 of marblehead squashes were placed in sandy soil in the garden, in the same place and manner and by the same person who planted all the other seeds and all those which are mentioned below.

Of the Boston marrow, 123 or 62+ per cent germinated; of the marblehead, 100 or 50 per cent germinated.

On July 30th, in a vacant room of the greenhouse, where, during a part of the day, the mercury rose to 115° to 136° F., were placed in test plates kept covered and damp, 35 seeds of Boston marrow and 15 seeds of marblehead.

Of these Boston marrow, 34 or 97 per cent sprouted; of the marblehead, 13 or 86 per cent sprouted.

On August first, in the stove-room where plants were kept in damp air at 90° to 98° F., 100 seeds of Boston marrow were placed in damp folds of thick woolen paper, enclosed in a wire box to keep away vermin. Of these, 95 per cent germinated.

SUMMARY

Of the above in regard to squash seeds:

200 Boston marrow in the garden, germinated	62 per cent
35 Boston marrow in a hot room of the greenhouse, at 136° F.	97 per cent
100 Boston marrow in a stove-room of the greenhouse	95 per cent

200 seeds of Marblehead in the garden, germinated	50 per cent
15 seeds Marblehead in the hot room of the greenhouse, at 136° F.	86 per cent

On June 16th, weather quite cool, seeds of melons were placed in porous saucers for two weeks, where only one side was kept moist. No seeds germinated. The seeds were then placed in dishes of moist sand and covered with moist carpet paper. In four days, 50 seeds of the Boss, from J. H. Landreth's, were counted and showed that 86 per cent had germinated. The same amount of Harris's Christina remained in the damp saucers three weeks without germinating. They were then placed in sand as those above, and after six days 80 per cent germinated.

Seeds of Peerless water melons were sent me by D. M. Ferry & Co., with a view to testing.

On July 15, in the botanical laboratory, with an afternoon temperature ranging about 86° F., 360 seeds were placed in Krelage's test plates in lots of 25, 30, and 50 seeds. These plates were set in dinner plates containing a little water, and all were covered to prevent evaporation. A trifle over 98 per cent germinated.

On the same day, in the same room, 900 seeds were placed in porous saucers and these set in plates of water. In some saucers the seeds were kept under water; in others, the seeds seemed too dry. Of all the 900, 96 per cent germinated.

On July 22d, in the same room, 600 Peerless melon seeds were tested in porous saucers and 600 in test plates.

Of those in saucers	95	per cent grew;
Of those in test plates	95.5	per cent grew;
400 seeds in the garden averaged	57	per cent.

On July 30th, in the hot vacant room of the greenhouse above referred to, where the thermometer ran up to 136° F. in the daytime, 50 seeds of Peerless water melon of the above lot gave 98 per cent of living seeds. In the damp stove-room above mentioned 200 seeds gave 98 per cent.

Summary of Testing Seeds of Peerless Water Melon.

360 seeds in test plates, at 86° F., germinated	98	per cent.
900 seeds in porous saucers, at 86° F., germinated	96	per cent.
600 seeds in test plates germinated	95.5	per cent.
600 seeds in porous saucers	95	per cent.
50 seeds in test plates in the greenhouse, at 136° F., germinated	98	per cent.
50 seeds in wet paper in the stove-room	98	per cent.

Similar tests were made at the same time with seeds of White Spine cucumber.

200 seeds in the garden germinated	90	per cent.
100 seeds in the greenhouse in plates, at 136° F., germinated	99	per cent.
200 seeds in stove-room of the greenhouse germinated	97½	per cent.

By comparing all these summaries of tests of seeds of large squashes, pumpkins, melons, and cucumbers it will be seen that seeds of cucumbers and melons vary less when tested under different conditions than do seeds of pumpkins and squashes; that seeds of squashes and pumpkins show the highest per cent of growing seeds when subjected to a maximum heat of 100° to 136° F.

TESTING SEEDS AT CONSTANT TEMPERATURES.

J. L. Campbell of West Elizabeth, Penn., manufactures an incubator or egg-hatcher which is intended to run at a uniform temperature for some days.

He made a machine on the same plan for testing seeds. It is heated by an ordinary number two kerosene hand lamp. The room or box containing seeds also contains a band of metal fastened by each end to a board. When warm, the metal expands and bends, as the two ends are stationary. This band of metal is connected by a series of delicate levers with a trap door, which is opened or closed more or less to control the draft of the lamp.

Sometimes the tester has not been seen to vary more than one degree or two in several days. At other times it has varied more.

This machine, after some "tinkering," was used in making the tests mentioned below.

I had anticipated, in particular, to test dent corn raised in Mississippi or Texas for some years by the side of dent corn raised for some years in Michigan; but the seed from the South was more or less infested with insects, so it was impossible always to tell which seeds were sound and which were unsound. This test was not satisfactory, as will be seen.

On June 30th, nine candy jars holding about two quarts each were half or two-thirds filled with damp sand. Each jar contained twenty kernels of good dent corn grown at the College on the previous year. Previous experiments showed that the corn was in good condition for germination. The temperature was kept at 120° F.

In one jar seven kernels sprouted. None of the rest started. There were 180 kernels in all.

This jar containing the germinating kernels stood next to the small door of the box where the temperature may have been a trifle lower.

On July 5th, in the same jars of moist sand the following seeds were tested: In this case the weather varied considerably and the thermometer in the seed box varied more than usual,—from 117° to 123° F. There were 50 kernels of sound dent corn from Michigan, 50 kernels of dent corn from Mississippi, 50 kernels of dent corn from Texas, 100 good seeds of Turban squash, 100 good seeds White Spine cucumber, 50 good seeds crook-neck squash, 50 seeds nutmeg melon. Not one seed grew.

On July 20th, the following seeds were tested in the manner above described with the thermometer ranging from 110° to 115° F.:

50 nutmeg melon, college seeds, all grew	100 per cent
50 white spine cucumbers, college seeds, all failed	0 " "
50 turban squash, college seeds, all failed	0 " "
50 kernels of Texas dent corn, 5 grew	10 " "
50 kernels of Mississippi dent corn, 11 grew	22 " "
50 kernels of Michigan dent corn, all grew	100 " "

The young seedlings in all cases soon showed signs of too great heat and died. It will be interesting to notice that the dent corn of Michigan stood a higher heat than the southern corn, which doubtless possessed a weak vitality. Also observe that all the college seeds of melons germinated, that all the seeds of cucumbers and turban squashes failed. There is something unsatisfactory about the test. Possibly it may be in the supply of air.

On June 26, 9 jars, each contained 20 kernels, 180 in all, of good Michigan dent corn. Temperature 100° F. All the kernels grew but one.

On July 27, the following were tested at 95° to 100° F.

50 white spine cucumbers grown by or sold by Sibley of Rochester, 10 grew	20 per cent
50 nutmeg melon grown by or sold by Sibley of Rochester	44 " "
50 early frame cucumbers grown by or sold by Sibley of Rochester	11 " "
30 white bush squash grown by or sold by Sibley of Rochester	60 " "
50 white spine cucumbers (D. M. Ferry)	40 " "
100 nutmeg melon (D. M. Ferry)	67 " "
50 turban squash, good seed grown by Michigan Agricultural College	66 " "

These experiments at uniform or nearly uniform temperatures need repeating.

J. M. Thorborn & Co.

The seeds were ordered by a friend directly of these seedsmen and tested in 1881:

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Early Flat Dutch	In damp paper.	65°—75°F	100	77
" Corn Salad	" "	65 —75	100	44
" Early Winnigstadt	" "	65 —75	100	75
"	" "	70 —75	100	55
Cauliflower, Fine Algiers	" "	70 —75	100	70
Lettuce, Early Curled	" "	70 —75	100	75
" Large White	" "	70 —75	100	70
" American	" "	70 —75	100	94
" All the Year Round	" "	70 —75	100	93
" Paper White	" "	70 —75	100	23
Onions, Yellow Danvers	" "	70 —75	100	29
" The Queen	" "	70 —75	100	4
" White Portugal	" "	70 —75	100	75
Peas, Champion of England	In the open ground.	80 —90	200	34
" McLean's Advance	" " "	80 —90	200	29
" " "	Moist sand in greenhouse.	80 —90	50	18
Cabbage, Drumhead Savoy	In hot bed.	85 —90	100	25
" Large Flat Dutch	" "	85 —90	100	50
" Early Winnigstadt	" "	85 —90	100	33

Seeds bought of a grocer in Lansing:

Melon, Ice Cream	Porous Saucers.	65°—75°	50	80
Radish, Scarlet Short Top	" "	70 —80	100	24
" French Breakfast	" "	70 —80	100	48

D. M. Ferry & Co.

Seeds bought by a friend directly of the seedsmen and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Early Flat Dutch	Damp paper	65°—75°F	100	91
Rutabagas	“ “	70 -75	100	47
Lettuce, Early Curled	“ “	70—75	100	00
Onions, Yellow Danvers	“ “	70—75	100	91
Squash, Boston Marrow	Test plates	115-136	35	97
“ Marblehead	“ “	115-136	15	95
Cucumbers, White Spine	“ “	115-136	100	99
Melon, Nutmeg	“ “	115-136	100	100
“ Peerless	“ “	115-136	50	98
Squash, Boston Marrow	Damp paper	90—98	100	96
Melon, Peerless	“ “	90—98	200	98
“ Nutmeg	“ “	90—98	200	97
Cucumber, White Spine	“ “	90—98	200	97
Melon, Peerless	Test plates	75—90	200	98
“ “	Porous saucers	75—90	900	96
“ “	Open ground	65—85	200	61
“ Cantelope	Test plates	75—85	400	93
Squash, Boston Marrow	Open ground	65—85	200	61
“ Marblehead	“ “	65—85	200	50
Cucumber, White Spine	“ “	65—85	200	90
Cabbage, Late Flat Dutch	Hot bed	85—90	100	70

Seeds bought at groceries in Lansing, 1881, and tested during the year.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Melon, Peerless	Porous saucers	65°—75°	50	80
Squash, Hubbard	Open ground	70 —80	200	73
Pumpkins	“ “	70 —80	250	70
Radish, French Breakfast	Porous saucers	70 —80	100	51
“ Long Scarlet	“ “	70 —80	100	30
Cabbage, Flat Dutch	“ “	85 —90	100	73
Corn, Early Sweet	Moist sand	85 —90	50	64
“ Minnesota Sweet	“ “	85 —90	50	78
Pea, McLean's Little Gem	“ “	85 —90	50	84
“ Dwarf Tom Thumb	“ “	85 —90	50	90
Beet, Dwarf Blood	“ “	85 —90	50	60
Bean, Golden Wax	“ “	85 —90	25	100
Cabbage, Early Winnigstadt	Porous saucers	85 —90	200	70
Melon, Peerless	Moist sand	80 —85	25	76
Squash, Early Bush	“ “	80 —85	25	76
“ Hubbard	“ “	80 —85	30	13
“ Summer	“ “	80 —85	25	64
Tomatoes, Gen. Grant	“ “	80 —85	50	76
Lettuce, Drumhead	Porous saucers	85 —90	100	00
“ Early Prize	“ “	85 —90	100	00
Parsnip, White	“ “	85 —90	100	00
Onions, Yellow Danvers	“ “	85 —90	100	51
Radishes, Long Scarlet	“ “	85 —90	100	10
Carrot, Long Orange	“ “	85 —90	100	22
Turnip, Early White	“ “	85 —90	100	50
Cucumbers, Long Green	“ “	85 —90	100	78

D. M. Ferry & Co.—(Continued.)

Seeds bought at stores in Lansing, 1882, and tested the same year.

Variety of seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Onions, Yellow Danvers	Test plates	70°—80°	125	63
Peas, Extra Early	Porous saucers	70 —80	100	93
Onions, Yellow Danvers	" "	75 —85	100	51
Peas, Early Frame	" "	75 —85	50	94
Beans, Golden Wax	" "	75 —85	40	95
Cucumber, White Spine	" "	75 —85	100	99
Melon, Nutmeg	" "	75 —85	100	95
" Peerless	" "	75 —85	100	97
" Black Spanish	" "	75 —85	30	90
" Nutmeg	" "	75 —85	100	96
" Peerless	" "	75 —85	90	88
Cucumber, White Spine	" "	75 —85	50	88
Onions, Red Wethersfield	" "	75 —85	100	65
Lettuce, Early Prize Head	" "	80 —90	200	92

B. K. Bliss & Sons.

Seeds bought by a friend direct from these seedsmen and tested in 1881.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Early Wakefield	Damp paper	65°—75°	100	74
" Flat Dutch	" "	65 —75	100	68
" Early Winnigstadt	" "	65 —75	100	65
" Red Dutch	" "	65 —75	100	80
Cauliflower, Early Paris	" "	70 —75	100	45
Lettuce, Royal Summer	" "	70 —75	100	43
" Early Butter	" "	70 —75	100	65
" Early Curled	" "	70 —75	100	94
Onions, Early Cracker	" "	70 —75	100	00
" Yellow Danvers	" "	70 —75	100	00
" Red Wethersfield	" "	70 —75	100	77
" White Portugal	" "	70 —75	100	64
Beans, Refugee	Porous saucers	75 —85	100	95
" Early China	" "	75 —85	100	100
Summer Savory	Test plates	85 —90	1200	05
Thyme	" "	85 —90	1200	15
Summer Savory	" "	85 —90	600	03
Thyme	" "	85 —90	600	11
Sage	" "	85 —90	300	30
Radishes, Scarlet Turnip	Porous saucers	70 —80	100	70
" Short Top	" "	70 —80	100	14
" Scarlet Olive	" "	70 —80	100	12
Peas, Early Dan O'Rork	In open ground	70 —80	400	38
" Champion of England	" "	70 —80	400	47
Lettuce, Double Curled	Damp paper	75 —80	100	57
Peas, Champion of England	Moist sand	70 —75	50	54
" Marrowfat	" "	70 —75	50	82
" Early Dan O'Rork	" "	70 —75	50	76
Cabbage, Red Pickling	Hot bed	85 —90	100	47
" Premium Flat Dutch	" "	85 —90	100	65

J. J. H. Gregory.

Seeds bought by a friend directly of this firm and tested in 1881.

Variety of Seeds.	Mode of Testing	Temperature.		Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	42
Cauliflower, Dwarf Erfurt	" "	70 —75	100	47
Lettuce, Early Curled	" "	70 —75	100	00
Onions, Yellow Danvers	" "	70 —75	100	3

Shaker's Seed Co., Lebanon, N. Y.

Seeds bought by a friend of this firm and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage. Flat Dutch	Damp paper	65 —75	100	70
Pea, Extra Early	Damp sand	70 —75	50	74
" Dwarf	" "	70 —75	50	88
Seeds bought at a grocery in Lansing and tested in 1881.				
Radish, Short Top Scarlet	Porous saucers	70 —80	100	00

Peter Henderson.

Seeds bought by a friend of this firm and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature	Seeds Tested.	Per cent Germinated.
Cabbage, Early Summer	Damp paper	65°—75°	100	93
" Flat Dutch	" "	65 —75	100	41
Cauliflower, Early Paris	" "	70 —75	100	87
Lettuce, Black Seed	" "	70 —75	100	10
" Early Curled	" "	70 —75	100	78
Onions, Yellow Danvers	" "	70 —75	100	3
" White Italian	" "	70 —75	100	4
" Red Wethersfield	" "	70 —75	100	11
" White Globe	" "	70 —75	100	3
" Yellow Dutch	" "	70 —75	100	3
Beans, Black Wax	Porous saucers	75 —85	100	98
" Red Valentine	" "	75 —85	100	97
" Speckled Cranberry	" "	75 —85	100	95
" Lima	" "	75 —85	100	96
Thyme	Test plates	75 —90	1200	21
"	" "	75 —90	600	15
Peas, Carter's First Crop	In open ground	75 —90	200	49
" Champion of England	" "	75 —90	200	31
" " " "	Damp sand	70 —75	50	64
" Carter's First Crop	" "	70 —75	50	62
Cabbage, Premium Flat Dutch	In hot bed	80 —90	100	60
Pumpkin, Sage Cheese	Moist sand	70 —80	25	72
Radish, Long Scarlet	Porous saucers	70 —80	100	05
" Early Scarlet Turnip	" "	70 —80	100	74
" Rose Colored	" "	70 —80	100	91

David Landreth.

Seeds bought of this firm by a friend and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Early Drumhead	Damp paper	65°–75°	100	82
Rutabaga	“ “	70 –75	100	80
Lettuce, Early Cabbage	“ “	70 –75	100	100
Onion Early Red	“ “	70 –75	100	88
Beans, White Dutch	Porous saucers	75 –85	50	94
Radish, Long Scarlet	“ “	75 –85	100	78
“ Red Turnip Rooted	“ “	75 –85	100	75
Peas, McLean's Little Gem	In open ground	75 –85	160	52
“ Champion of England	“ “	75 –85	280	50
“ Extra Early	“ “	75 –85	310	50
“ Early Frame	“ “	75 –85	460	72
“ Extra Early	Moist sand	70 –75	50	48
“ Champion of England	“ “	70 –75	50	38
“ McLean's Little Gem	“ “	70 –75	50	28
“ Early Frame	“ “	70 –75	50	90
Cabbage, Late Flat Dutch	In hot bed	80 –90	100	65

Seeds bought of groceries in Lansing and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Lettuce, Early Curled	Porous saucers	° –	100	00
Celery, White	“ “	85 – 90	101	53
Onions, Red Wethersfield	“ “	85 –90	100	79
“ Yellow Danvers	“ “	85 –90	100	90
Radish, Long Scarlet	“ “	85 –90	100	47
Cucumbers, Early Frame	“ “	85 –90	100	90
Cabbage, Red Dutch	“ “	85 –90	100	73
“ Early Drumhead	“ “	85 –90	100	76
“ Early York	“ “	85 –90	100	65
Rutabaga, Purple Top	“ “	85 –90	100	52
Cabbage, Flat Dutch	“ “	85 –90	100	76
Pea, Dwarf Tom Thumb	“ “	85 –90	50	96
“ Little Gem	“ “	85 –90	50	92
“ Champion of England	“ “	85 –90	50	98
Corn, Evergreen Sugar	“ “	85 –90	50	94
“ Minnesota Sweet	“ “	85 –90	50	94
“ Early Crosby	“ “	85 –90	50	84
Beans, Wax	“ “	85 –90	25	100
Beet, Blood Turnip	“ “	85 –90	50	64
“ Blood Red	“ “	85 –90	50	56
“ Long Blood	“ “	85 –90	50	60
Melon, “Boss”	Moist sand	80 –85	25	81
Squash, Summer	“ “	80 –85	25	92
“ Hubbard	“ “	80 –85	25	92
Tomatoes, Paragon	“ “	80 –85	50	50
“ Gen. Grant	“ “	80 –85	50	72
“ Acma	“ “	80 –85	50	58

Detroit Seed Co.

Seeds bought of this firm and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	19

James Vick.

Seeds bought of this firm by a friend and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	82
“ Late Drumhead	“ “	65 —75	100	89
Cauliflower, Early Erfurt	“ “	70 —75	100	50
Lettuce, Early Tennis Ball	“ “	70 —75	100	84
“ Malta	“ “	70 —75	100	79
“ “Cos”	“ “	70 —75	100	69
Onions, Yellow Danvers	“ “	70 —75	100	32
“ Red Wethersfield	“ “	70 —75	100	92
Beans, Red Valentine	Porous saucers	75 —85	100	100
“ Lima	“ “	75 —85	50	98
Summer Savory	Test plates	85 —90	1200	37
“ “	“ “	85 —90	600	28
Sage	“ “	85 —90	300	55
Peas, Champion of England	In open ground	85 —90	200	36
“ Kentisch Invicta	“ “	85 —90	200	52
Lettuce, Moss Curled	Damp paper	75 —80	100	19
Peas, Champion of England	Damp sand	75 —80	50	32
“ Kentisch Invicta	“ “	75 —80	50	60
Cabbage, Late Drumhead	In hot bed	80 —90	100	90
“ Short Stem	“ “	80 —90	100	50
Seeds bought at store in Lansing and tested, 1881.				
Radish, Rose Olive Rooted	Porous saucers	70°—80°	100	81
“ Long Scarlet	“ “	70 —80	100	67
“ White Turnip	“ “	70 —80	100	59

Department of Agricultnre, Washington, D. C., 1881.

Variety of Seed.	Mode of Testing.	Temperatur.	Seeds Tested.	Per cent Germinated.
Lettuce, Paper White	Damp paper	70°—75°	100	78
“ Long Princess	“ “	70 —75	100	100
Beans, Golden Wax	Porous saucers	75 —85	100	96
Tobacco, Big Orinoco	Test plates	75 —90	1200	30
“ White Burley	“ “	75 —90	1200	60
Lettuce, Moss Curled	Damp paper	75 —80	100	3

Briggs & Bro.

Seeds bought of this firm by a friend and tested in 1881.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	27
Lettuce, Early Curled	“ “	70 —75	100	4
Onions, Yellow Danvers	“ “	70 —75	100	3

Joseph Harris.

Seeds bought by a friend of this firm and tested in 1881.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Imperial Brunswick	Damp paper	65°—75°	100	60
“ Early York	“ “	65 —75	100	39
“ Red Pickling	“ “	65 —75	100	54
“ Short Stem	“ “	65 —75	100	88
Cauliflower, Welcherm	“ “	70 —75	100	62
“ Large Lenornand	“ “	70 —75	100	87
Lettuce, Early Tennis Ball	“ “	70 —75	100	71
“ “Cos”	“ “	70 —75	100	94
“ The Deacon	“ “	70 —75	100	93
“ Ice Cabbage	“ “	70 —75	100	88
Onions, Yellow Danvers	“ “	70 —75	100	78
“ White Globe	“ “	70 —75	100	74
Beans, Lima	Porous saucers	75 —85	50	97
“ Black Wax	“ “	75 —85	100	95
Cabbage, Red Pickling	In hot bed	80 —90	100	54
“ Drumhead Savoy	“ “	80 —90	100	3
“ Fotler's Drumhead	“ “	80 —90	100	35
“ Early York	“ “	80 —90	100	30
“ Short Stem	“ “	80 —90	100	38
Seeds bought at store in Lansing.				
Cabbage, Imperial Brunswick	Porous saucers	80 —90	200	52
Radish, Rose Olive Shaped	“ “	70 —80	100	87
“ Red Turnip	“ “	70 —80	100	37
“ White Turnip	“ “	70 —80	100	32

Isaac Tillinghast.

Seeds bought by a friend of this firm and tested in 1881.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	45
Lettuce, Malta	“ “	70 —75	100	36
Onions, Yellow Danvers	“ “	70 —75	100	84
Radish, Early Scarlet	Porous saucers	70 —80	100	4
Cabbage, Premium Flat Dutch	In hot bed	80 —90	100	50

William Carson.

Seeds bought of this firm by a friend and tested in 1881.

Variety of Seeds.	Mode of Testing.	Temperature	Seeds Tested.	Per cent Germinated.
Cabbage, Flat Dutch	Damp paper	65°—75°	100	62
" Early Winnigstadt	" "	65 —75	100	61
Lettuce, Early Curled	" "	70 —75	100	60
" Tennis Ball	" "	70 —75	100	53
Onions, Yellow Danvers	" "	70 —75	100	79
" Giant Rocca	" "	70 —75	100	10
" White Portugal	" "	70 —75	100	77
" Marzagola	" "	70 —75	100	2
Beans, Black Wax	Porous saucers	75 —85	100	97
" Lima	" "	75 —85	100	100
Peas, Little Wonder	In open ground	75 —85	160	28
" Saxton's Alpha	" "	75 —85	400	41
" Champion of England	" "	75 —85	100	12
Lettuce, Double Curled	Damp paper	75 —80	100	68
Peas, Champion of England	Damp sand	70 —75	50	54
" Carter's Challenge	" "	70 —75	50	20
" Little Wonder	" "	70 —75	50	36
Cabbage, Red Pickling	In hot bed	80 —90	100	35
Seeds bought at a store in Lansing and tested in 1881.				
Radish, Early Scarlet Turnip	Porous saucers	85 —90	100	20
Cabbage, Drumhead Savoy	" "	85 —90	200	86

Hiram Sibley.

Seeds bought in Lansing and tested in 1882.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Onions, Yellow Danvers	Test plates	70°—80°	125	09½
" " "	Porous saucers	75 —85	100	23
Peas, Extra Early	" "	75 —85	100	94
" Champion of England	" "	75 —85	50	41
" McLean's Little Gem	" "	75 —85	50	44
Beans, Golden Wax	" "	75 —80	50	100
Cucumbers, White Spine	" "	75 —80	100	96
Melon, Nutmeg	" "	75 —80	100	100
" "	" "	75 —85	50	82
Cucumber, White Spine	" "	75 —85	50	66
Onion, Red Wethersfield	" "	75 —85	100	34
Lettuce, Lee's Immense Hardy	" "	75 —85	200	00
" " " "	" "	75 —85	200	00
" Simpson's Early Curled	" "	75 —85	200	40
" Frankfort Head	" "	75 —85	200	43
Onion, Giant Rocca	Damp paper	70 —80	100	59
Radish, French Breakfast	" "	70 —80	100	65
Cabbage, Late Flat Dutch	" "	70 —80	100	75
Beet, Early Blood	" "	70 —80	50	22
Carrot, Long Orange	" "	70 —80	100	38
Onions, Yellow Danvers	" "	70 —80	100	37
Cucumber, Early Frame	" "	70 —80	100	57
Squash, White Scallop	" "	70 —80	50	62
Melon, Phinney's Early	" "	70 —80	50	86
Squash, Hubbard	" "	70 —80	50	37

College Seed.

Seeds saved in 1881, tested in 1882.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Onions, Yellow Danvers	Test plates	70°—80°	250	96
“ “ “	Porous saucers	70 —80	100	88
Peas, Champion of England	“ “	70 —80	100	99
“ Early Frame	“ “	75 —85	50	90
“ Extra Early	“ “	75 —85	50	90
“ Champion of England	“ “	75 —85	50	96
“ Dan O'Rork	“ “	75 —85	50	90
Lettuce, Lee's Mammoth	“ “	75 —80	200	100
“ Ferry's Curled	“ “	75 —80	200	100
Melon, Nutmeg	“ “	75 —80	100	80
Cucumber, White Spine	“ “	75 —80	100	100
Squash, Crook Neck	“ “	75 —80	50	96
Lettuce, Lee's Mammoth	“ “	75 —80	200	100
“ Ferry's Mammoth Curled	“ “	75 —80	200	100
Melon, Nutmeg	“ “	75 —85	50	86
“ Peerless	“ “	75 —85	50	86
Onion, Red Wethersfield	“ “	75 —85	100	99

Crossman.

Seeds bought at a store in Lansing in 1882.

Variety of Seeds.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Peas, Extra Early	Porous saucers	70 —80	100	87
Beans, Golden Wax	“ “	70 —80	50	100

David Landreth.

Seeds bought at a store in Lansing in 1882.

Variety of Seed.	Mode of Testing.	Temperature.	Seeds Tested.	Per cent Germinated.
Lettuce, Early Cabbage	Porous saucers	75°—85°	200	95
Squash, Boston Marrow	“ “	70 —80	25	84
“ Early White Bush	“ “	70 —80	50	70
Cabbage, Early Market	“ “	70 —80	100	75
Melon, Ice Rind	“ “	70 —80	50	78
“ “ “	“ “	70 —80	100	84
Lettuce, Bloomsdale Early	“ “	70 —80	100	100

The following test was made of the seeds of beets obtained from various sources. Large pieces (or fruits) were compared with small fruits.

Variety.	Where Obtained.	Mode of Testing.	Temperature.	No. Tested.		Per cent Germinated.	
				Large.	Small.	Large.	Small.
Bassano	S. B. Mann	Damp paper	65°—70°	10	10	100	90
Early Blood	" "	" "	65 —70	10	10	90	80
Long Blood	Peter Henderson	" "	65 —70	10	10	100	70
Early Blood	" "	" "	65 —70	10	10	80	50
Sugar	Joseph Harris	" "	65 —70	10	10	60	50
Bassano	" "	" "	65 —70	10	10	60	10
Long Blood	" "	" "	65 —70	10	10	60	50
Improved Blood	" "	" "	65 —70	10	10	60	50
Early Blood	B. K. Bliss	" "	65 —70	10	10	100	100
Dark Egyptian	" "	" "	65 —70	10	10	100	50
Long Blood	J. J. H. Gregory	" "	65 —70	10	10	100	90
Long Blood	Lyman	" "	65 —70	10	10	80	60
Long Blood	James Vick	" "	65 —70	10	10	100	70
Early Blood	—— Briggs	" "	65 —70	10	10	100	30
Early Blood	Wm. Carson	" "	65 —70	10	10	80	30
Early Blood	J. M. Thorborn	" "	65 —70	10	10	50	60
Dark Egyptian	" "	" "	65 —70	10	10	90	30
Bassano	J. B. Root	" "	65 —70	10	10	60	50
Early Blood	" "	" "	65 —70	10	10	100	80
Dark Egyptian	" "	" "	65 —70	10	10	100	60
Ferry's Dark Blood	S. B. Mann	" "	65 —70	10	10	80	30
Long Blood	D. M. Ferry	" "	65 —70	10	10	100	70
Long Blood	David Landreth	" "	65 —70	10	10	60	60
Early Blood	Shaker's	" "	65 —70	10	10	100	80
Early Blood	I. Tillinghast	" "	65 —70	10	10	60	20

Experiments in Testing Indian Corn.

In the spring of 1881 the seed corn in some parts of the State was found to be poor. Accordingly samples which had been saved for seed, were obtained from various sources throughout the State, and tested in different ways for the purpose of ascertaining its germinating powers. The following are the results obtained:

No.	Variety.	Where Obtained.	Mode of Testing.	Temperature	No. Tested.	Per cent Germinated.
1		Schoolcraft	In moist sand	65°—70°	50	84
2	Yellow Dent	"	" " "	65 —70	50	92
3	Flint	"	" " "	65 —70	50	98
4		"	" " "	65 —70	40	5
5	White Dent	Lapeer	" " "	65 —70	50	00
6	Smutnose	"	" " "	65 —70	50	62
7	Dent	Rochester	" " "	65 —70	50	100
8	Yellow Dent	Oceana Co	" " "	65 —70	18	100
9	Flint	St. Joe Co	" " "	65 —70	50	100
10	White Dent	Miss. Ag. College	" " "	65 —70	50	88
11	Yellow Dent	Schoolcraft	In thick paper	65 —70	200	93
12	White Dent	Miss. Ag. College	" " "	65 —70	200	84
13	Flint	Schoolcraft	" " "	65 —70	200	100
14	Yellow Dent	Oceana Co	" " "	65 —70	150	98
15	Flint	St. Joe Co	" " "	65 —70	150	100
16	White Dent	Lapeer	" " "	65 —70	50	00
17	White Flint	Commerce	" " "	65 —70	25	12
18	White Flint	"	" " "	65 —70	50	10
19	White Flint	Allegan	" " "	65 —70	25	100
20	Yellow Dent	Lansing	" " "	65 —70	70	4
21	Early Sweet	" (Jones & Porter)	Moist sand	65 —70	50	70
22	Minn. Sweet	" " "	" "		50	78
23	Sugar	" Porter & Haines	In moist sand	65 —75	50	94
24	Early Crosby	" " "	" "	65 —75	50	84

Seeds Tested by Special Request.

The following seeds were offered to D. M. Ferry & Co., by samples. These were tested by Prof. W. W. Tracy, of that firm, and did not germinate satisfactorily. Our tests corresponded very well with theirs.

No.	Variety.	Mode of Testing.	Temperature.	No. Tested.	Per cent Germinated.
25	Egyptian	In moist sand	68°—70°	30	3
26	Egyptian	Soak'd-da'p paper	68 —70	30	10
27	Egyptian	Damp paper	68 —70	30	12
28	Evergreen	Moist sand	68 —70	50	40
29	Evergreen	Soak'd-da'p paper	68 —70	50	58
30	Evergreen	Damp paper	68 —70	50	54

EXTRA FINE SEEDS OF AGROSTIS VULGARIS, RED TOP.

This sample was sent for examination by J. M. Thorburn & Co., of New York.

In market as usually seen, the glumes and both paleæ surround the seed or grain. In this case, both glumes and most of the paleæ were removed.

WILL SEEDS SPROUTED ONCE AND WELL DRIED, SPROUT AGAIN?

In the opinion of some people seeds will never sprout more than once. This question not unfrequently becomes a matter of considerable importance, as for example after the recent harvest of 1882, when wheat was badly damaged by rains. "To sprout," means "to germinate;" "to vegetate;" "to begin to grow;" "to shoot, as the seed or the root of a plant."

In each of the cases named below the roots died at the end of each test and new ones pushed out when moistened again. The same plumule or ascending axis lived over, or endured the alterations of drying and moistening.

In 1881 a few experiments were made with some wheat of low vitality purchased at Ingersoll's mills, in Lansing. After sprouting once and drying till a miller would say it was dry enough to grind, 100 kernels were tried a second time, when 47 per cent germinated. At another time, of 50 kernels of this wheat one sprouted a little and dried, 48 germinated, or 96 per cent. These were dried and tested a third time, when 44 germinated, or 88 per cent.

For another test, of 50 kernels of this wheat, once sprouted till the plumule was ½ inch long, and the roots 1 to 2 inches; 41 germinated, or 82 per cent. Of these well dried, 24 germinated a third time, 48 per cent.

For another test, of 50 kernels of this wheat once sprouted till the plumule was 1 inch long and the roots 2 inches, 19 germinated, or 38 per cent. Of these well dried, 7 germinated a third time, 14 per cent.

Some imperfect tests with good new wheat gave still better results.

Of oats tested at the same time, 65 per cent germinated a second time.

SHALL WE USE SPROUTED WHEAT FOR SEED?

As will be seen by the foregoing tests, and by the following tests, wheat once or twice, or more times sprouted, is likely to grow again. Sprouting weakens the grain to some extent, depending on how far the sprouting process was continued before it was arrested by drying. If it were my own case I should use sprouted wheat for seed. It may not be a good practice.

In the summer of 1882, similar experiments were tried with wheat grown on the college farm. Two varieties were used, viz.: Clawson and Shumacher. Of the Clawson 100 kernels were sprouted, then thoroughly dried and then tried a second time; 100 per cent germinated. These were dried and tested a third time, when 97 per cent germinated. These were tested a fourth time, when 93 per cent germinated. These were dried and tested a fifth time, when 84 per cent germinated. These were dried and tested a sixth time, when 38 per cent germinated.

Of the Shumacher variety, 100 kernels were sprouted then dried in a similar manner as the Clawson. These tested a second time, 100 per cent germinated. The third time, 90 per cent germinated. The fourth time, 87 per cent germinated. The fifth time, 67 per cent germinated. The sixth time, 8 per cent germinated.

For another test 100 kernels of buckwheat were used. After sprouting once the whole was thoroughly dried, then tested a second time, when 100 per cent germinated. The third time 100 per cent germinated. The fourth time 98 per cent germinated. The fifth time 65 per cent germinated. The sixth time 39 per cent germinated.

In 1881 small quantities of grass seed were purchased directly of the following dealers by a friend: D. M. Ferry & Co., James Vick, Wm. Carson, B. K. Bliss & Son, David Landreth, and Peter Henderson. After a thorough mixing of each small package, one ounce of each was carefully examined and assorted. Owing to other work it was not possible to make this examination till 1882. For this reason no test of vitality was made. All the samples examined were of very fair appearance, and none of them contained seeds of bad weeds.

GRASS SEEDS EXAMINED.

Kind of seeds.	Per cent. True to Name.	Nature of Impurities.
D. M. Ferry & Co.		
Dactylis glomerata	84	Mostly dirt, straw, and chaff.
Poa pratensis	96	“ “ “ “ “
Phleum pratense	97½	“ “ “ “ “
James Vick.		
Dactylis glomerata	96½	Straw, dirt, etc.
William Carson.		
Dactylis glomerata	90	“ “ “
Poa pratensis	96½	“ “ “
Phleum pratense	98	“ “ “
B. K. Bliss & Sons.		
Dactylis glomerata	80	“ “ “
Poa pratensis	92½	“ “ “
Phleum pratense	98	“ “ “
David Landreth.		
Poa pratensis	80	Dirt and foreign seeds, sedges, etc.
Peter Henderson.		
Poa pratensis	91½	Dirt and foreign seeds, sedges, and false buckwheat.

Package of mixed Lawn Grass, from D. M. Ferry & Co. Weight, 3 oz.; cost, 20 cents. One-half an ounce was examined and assorted and found to contain 80.1 per cent June Grass, 13.4 per cent English Rye Grass, 6.2 per cent White Clover, and .3 per cent Timothy. It will be seen that the leading constituent is *June Grass,* which is worth about two dollars per bushel; but figuring at the above cost, or 20 cents per package of three ounces, it would make it cost about fourteen dollars per bushel.

White Clover seed is worth $20 per bushel. But at the above rate it would cost about $60 per bushel by purchasing in small packages.

English Rye Grass seed is worth $3.50 per bushel. At the above rate it would cost about $21 per bushel.

Timothy seed is worth from $3 to $4 per bushel. At the above rate it would cost about $45 per bushel.

IMPROVING THE KEEPING QUALITY OF ONIONS.

Most onions begin to grow very soon on the approach of mild weather in spring.

Several years ago I selected in spring those White Globe onions which kept the longest without sprouting and planted them for seed. This process was repeated for some years. The onions were much improved in their "keeping quality," but the seeds were often of low vitality.

In 1881 I began the same kind of experiment with Yellow Danvers. From a lot of thirty bushels, those only which kept longest were used for seed.

PLATS OF GRASSES AND OTHER FORAGE PLANTS.

With some changes these have been kept up much as they were begun nine years ago, in 1873. Each report since that time has contained some account of these interesting plants. I have before referred to the assistance which we have rendered to other colleges in sending seeds of grasses to Harvard University, Ohio University, Purdue University, Kansas Agricultural College, Illinois Industrial University. We have sent a large number of accurately named bottles of grass seeds to the Agricultural Experimental Station in New York. Several times bunches have been sent to our State fairs, and numerous granges have been supplied with bunches of grasses accurately named.

These plats of forage plants are almost indispensable to my students, especially to advanced students, of whom we always have a number.

In these plats it has been found best to sow the seeds in close rows, so that they may be easily weeded. Experience has also taught me not to sow those which closely resemble each other in contiguous plats. In such cases they mix badly, and the mixing cannot be detected till the grasses send out their panicles for flowering.

Here we have tested our June grass, *Poa pratensis*, side by side with two lots of genuine blue grass from Kentucky, and find them one and the same. Here we have tested the "Evergreen Grass" of D. Caine, of Battle Creek, by the side of the taller oat grass, Avena elatior, to find them identical. This oat grass has been well known and grown in England and on the continent for over one hundred years. It appears to be well worth cultivating in our State. It grows rapidly and makes a good stand. It seeds freely and the seeds are large. Here have been tried Fowl Meadow Grass, Rye grasses, Sweet Vernal, Meadow Fox Tail, Orchard Grass, Red Top, and thirteen or more species of fescue. Here we have tested and wintered the famous Burmuda Grass, *Cynodon dactylon*, and the equally praised Johnson Grass, *Sorghum halepense*. Both of these grasses are liable to be winter killed, and neither of them start early enough to be valuable for spring use. Bermuda Grass blossoms but does not produce seeds; Johnson Grass has ripened seeds freely for two years past.

I have been especially interested in selecting and testing two or three fescues; the seeds of which were mixed in small quantity with seeds sent us from the Kew Gardens in England. I think they promise great things for dry weather. They grow rapidly; they are large and nutritious, and produce a good crop of large seeds.

None of the lupines have done well in the tests made on early sandy land. Several kinds of cow-peas have made a rapid and large growth after warm weather had fairly set in. I think them well worth a more extended trial. They are eaten greedily by horses, mules, and cattle in the Southern States. Horses have refused plants of green cow-peas, so far as I have tested them.

I have received from Sutton & Sons, England, seeds of several sorts of red clover which have been improved in that country. They seem to possess no especial merit for Michigan.

FEEDING SWEET VERNAL GRASS.

This grass, *Anthoxanthum odoratum*, when bruised or partially wilted, gives off a strong odor of benzoic acid, which much resembles the odor of Bokhara clover or melilotus or sweet clover and the Tonka bean. Sweet vernal retains this odor for a long time. It is often raised on lawns because the odor of the hay is so delightful. It is not unfrequently recommended as a valuable grass for early pastures.

A few experiments have been made, which are here reported.

A young horse had been kept on dry feed for a long time. On May 24, 1881, I cut a bunch of green *Poa pratensis,* June grass, and another of sweet vernal. The horse was first offered some of the June grass, which he ate. He was then offered some of the sweet vernal, which he ate at once. Then a bunch of June grass was placed on one side of his nose and some sweet vernal on the opposite side, when he took the June grass first. I reversed the bunches, when he again selected the June grass, which he finished and then picked up the scattering fragments of the same from a dirty yard, after which he returned to the sweet vernal and ate that also.

On May 25, one of my special students, W. C. Latta, made a similar experiment with samples of sweet vernal and meadow foxtail. Both were in flower and had been dried for several days. The cow Heroine rather preferred the meadow foxtail, but ate both readily. Heroine 2d ate both alike. Henrietta preferred the meadow foxtail, and did not care for the sweet vernal. An Ayrshire cow, Mary Stewart, ate both greedily, apparently without any preference. Two of the work horses of the farm department ate both alike, while a third horse preferred the meadow foxtail, but ate both readily.

The cows had been in pasture for some time, while the horses had been kept on cut hay and grain.

TESTING DARK-COLORED CLOVER SEED.

Numerous tests given in my last report show that clover seed will stand a good deal of bad weather and still not lose its vitality.

Dark-colored, bright-looking seeds are generally considered the best. In 1877 some light and some dark seeds were tested side by side. Fifty seeds of each were tried.

College seeds germinated	49 dark,	41 light.
Albion seeds germinated	48 dark,	42 light.
Paw Paw seeds germinated	43 dark,	41 light.
Total out of 150 each	140 dark,	124 light.

Some experiments made in 1881 give a different result.

Seeds were selected in lots of 50, 250 of dark and 250 of light-colored, with the following result: Dark germinated 240, light 244.

This illustrates the folly of attempting to draw general conclusions from a few experiments.

In the spring of 1881 two beds, each about 6 x 6 feet, were sown to red clover. In one, dark seeds only were sown; in the other, light seeds. These were picked from the same lot of seeds. For a time, at first, we thought the dark seeds did the best, but after a little no difference could be seen. A single plant in the bed sown to dark seeds was of unusually dark color. The leaves were thick, the flowers dark, the stems smooth and the plant vigorous.

DO BUMBLE BEES BENEFIT RED CLOVER?

From time to time I have seen reports asserting the great value of these bees in aiding clover blossoms to set seeds. Bumble bees have been exported to Australia for the purpose of inducing clover to seed more freely.

Without question, pollen of a flower gets freely on the stigma of the same flower, but this does not make it certain that pollen from another would not produce better results.

For six years past I have had some reliable students experimenting on this subject. The results are yet quite variable and unsatisfactory.

In the first year, the heads covered when young with sacks of muslin, yielded about two-thirds as many seeds as those left uncovered. In the second year, four heads covered before flowering yielded 18, 30, 38, 41 seeds respectively; four heads of the same age, left uncovered, yielded, respectively, 46, 54, 43, 57 seeds. In the third year, 31 heads of the first crop were covered as above. Only one yielded seeds, and that bore seven. Thirty-one heads of the same age, uncovered, yielded 11, 12, 2, 35, 40, 21, 3, 1, 22, 15, 15, 20, 16, 4, 29, 3, 25, 8, 15, 22, 24, 28, 41, 10, 22, 13, 18, 18, 10, 12, 10, an average of 17 seeds per head. In the third year for the second crop of clover, 9 heads were uncovered, and yielded 36, 51, 45, 58, 15, 26, 47, 31, 28, an average of about 37½ seeds to the head. Eleven heads covered yielded no seeds. In the cases above given the heads tied in sacks were allowed to fall to the ground, which may have damaged them to some extent. The shade of the sacks may also have been a hindrance.

In the fourth year, on the first crop eight heads were tied up and the sacks tied to stakes to keep the heads from the ground. These heads produced no seeds. The flowers of some of the same age uncovered were examined imperfectly, and the student says three-fifths of them produced seeds.

On the fifth year, 1881, seven young heads of the first crop were covered. One head only produced seed, and that one, three. This head, when in flower, was seen to have a small insect of some sort crawling over it. Eight heads of the same age not covered were examined. One of these contained 15 seeds; each of the other seven contained from 20 to 52 seeds.

The covered heads of the second crop and the uncovered heads yielded about the same number of seeds as did those of the first crop.

On the sixth year, 1882, two fine bunches of the first crop, apparently alike, were covered with mosquito netting. No insects were seen about either, except what are mentioned below.

On June 29th a bumble bee was placed inside of one netting and seen to work on the flowers.

On July 10th two more bumble bees were introduced and seen to work, and on July 12th more bumble bees were introduced, and were seen to work on the flowers.

On July 31st 50 ripe heads were selected from each plant, and the seeds carefully shelled and counted. The 50 heads on the plant where the bumble bees were excluded yielded seeds as follows:

40 heads	yielded seeds	0
6 heads	yielded one each	6
1 head	“	2
1 head	“	3
1 head	“	5
1 head	“	9
Total		25

The 50 heads on the plant where the bumble bees were inserted and seen to work under the netting, yielded seeds as follows:

29 heads	yielded	seeds		0
2 heads	“	one	each	2
5 heads	“	two	“	10
3 heads	“	three	“	9
3 heads	“	four	“	12
3 heads	“	five	“	15
1 head	“	seven	“	7
1 head	“	eight	“	8
1 head	“	nine	“	9
1 head	“	ten	“	10
1 head	“	twelve	“	12
Total				94

On Sept. 13th, 1882, I selected of the second crop of red clover five plants within ten feet of each other, which seemed to be much alike. They had not been covered or marked in any way. The seeds of 50 good heads of each plant were shelled out with the following results: 1,260, 1,275, 1,460, 1,485, 1,820. It will be seen that 50 heads from plant number five contained about one-third more seeds than 50 heads from plant number one.

In another place, 50 heads selected from one plant yielded 2,290 seeds, nearly twice as much as plant number one in the first lot.

From the last experiments we ought to learn a lesson in reference to drawing hasty conclusions from a few isolated cases.

In the spring of 1882 a student covered eight young heads of white clover with paper sacks. The sacks were tied up to stakes to keep the clover heads in a natural position. Eight similar uncovered heads near by were marked at the same time. Of the heads covered

5	yielded	seeds	0
1	“	seed	1
1	“	seed	1
1	“	seeds	3
Total			5

The eight heads of the same age left uncovered yielded from 25 to 35 seeds each, a total of 236 seeds.

These experiments, with those made by Darwin and others, make it look as though bees and bumble bees helped to fertilize the flowers of white and red clover, and cause the plants to set seeds more freely.

Very small insects could not be excluded in the experiments. These may have been present in some cases—were seen in a few cases on the flowers. If bumble bees do more good than harm, as we have very good reason to believe, we should encourage them and not "break them up." Bumble bees prefer to raise their colonies in old nests of meadow mice. It has been suggested that we should not keep many cats, nor allow hawks, and foxes, and dogs to catch these mice, which make nests so necessary for the bumble bees, which help fertilize our red clover.

The following, on "Variation of Red Clover," is an abstract of a paper, with with some additions, read at the last meeting of the Society for the Promotion of Agricultural Science, held in Montreal:

For the past two years I have been studying hundreds of plants of red clover at all seasons and stages of growth. I have marked and saved seeds of some twenty plants, which have shown the most distinct and widely different peculiarities.

Of course, we all know that soil and the distance the plants grow from each other have very much to do with the growth of the plants, but these different conditions alone cannot be considered as the cause of the present difference in the plants.

1. Individual plants show considerable difference in the EARLINESS of growth in spring and after cutting. This is especially true of the stems, which finally bear the heads of flowers. Some flowers may be seen in central Michigan by the first of June, on ordinary seasons, while other plants are nearly, or quite four weeks later.

2. Some plants STOOL OUT and send up many stalks; others, few.

3. On hot, dry days some plants WILT, while others show no signs of wilting.

4. There is a great difference in the HEIGHTS of plants, even where the soil appears to be uniform.

5. Some GROW ERECT, even where there is nothing to crowd them; others spread out at once, making a very small angle with the ground.

6. Some stems are LARGE, others SLENDER.

7. Some plants are densely PUBESCENT, others are nearly SMOOTH, and between these are all gradations. In this respect the same plant varies somewhat with the season.

8. The stems of some are pure LIGHT GREEN, or dark green, or tinged with purple, or even dark purple throughout.

9. The stems vary much in the LENGTH OF INTERNODES and length and number of branches.

10. On some plants the LEAVES are DARK green, smooth, and thick, with no trace of light-colored spots. On others, the leaves are light-colored, with or without spots, of variable size and shape. Some leaves are thin and flabby.

11. Some LEAFLETS are VERY WIDE in proportion to the length, others very narrow, and between these are all gradations.

12. The STIPULES vary in *shape* and *color* and in the position taken in regard to the main axis. Some clasp the main axis even with the tips. In

other cases the tips of the stipules stick out from the stem. One plant seen had the stipules conspicuously red in stripes.

13. The HEADS of flowers, so far as seen, were *sessile,* with an involucre of two leaves, which have leaflets varying much in width.

14. The HEADS vary much in size and somewhat in shape.

15. The CALYX tube and the lobes of the calyx vary in hardiness and somewhat in size.

16. The PETALS vary in length and in direction taken. Some are scarlet, others pink; some pale pink, some creamy white, some erect and quite close together, others more spreading.

17. Varying with the season, and probably with the plant, the PISTILS contain each from 0 to 2 or 3 or even 4 seeds each.

18. Some seeds are dark purple, others light yellow; between these are all gradations.

No. 1. Plant number one is early, has the *stems* few and small, erect, quite hairy, purplish; *leaflets* spotted, rather narrow, leaflets of the involucre lance-elliptical.

No. 3. Plant number three is early, has many young stems, is erect, rather smooth, purplish; leaflets with a faint spot, nearly round, rather light colored.

No. 4. Plant number four is early, stems numerous, spreading, quite hairy, purplish; leaflets with a spot prominent, dark in color.

No. 7. Plant number seven is early, stems many, large, erect, rather smooth, stem purplish; leaflets spotted, rather broad, of good size, light green; flowers white.

No. 8. Plant number eight is late, stems few, stout, sprawling, quite smooth, purplish; leaflets with scarcely a trace of a spot, rather narrow.

No. 10. Plant number 10 has stems very early, many, small, short, spreading, purplish, hairy; leaves few, small, rather round, a slight spot; heads small.

No. 11. Plant number eleven has stems rather erect, rather hairy, green; leaves with short, small spot on leaflets; stipules conspicuously *striped with red.*

No. 13. Flowers bright scarlet, like Italian clover.

No. 17. Plant number seventeen is very late, stems long, of medium size, spreading about, quite hairy, green; leaves light green, spot inconspicuous.

No. 18. Plant number eighteen is *very late,* pea vine, stems few, long, spreading from the first, hairy purplish; leaflets with a spot conspicuous, *very* narrow.

No. 19. Plant nineteen is a seedling of dark seed, stems early, many, large, tall, erect, smooth, purplish; leaflets rather broad, very dark green, thick, no trace of spots; flowers dark colored. This is the best plant, all things considered, which I have seen.

It seems to me there is a grand chance for doing something to improve our red clover by selection and perhaps aided by breeding.

We all know how wonderfully Indian corn varies. The plant is large and everybody sees it. The time required to get up a race of corn is short—four to ten years. We gain in uniformity and excellence in some one or more respects.

It looks as though we could do the same thing for red clover. This great variation in our fields of red clover is a broad hint at the results which may be attained by study and care.

I believe our fields of clover to-day contain nearly or quite as great a variety of plants as would a field of Indian corn, if we were to mix in a little seed of all the varieties cultivated in any one State.

I suppose for the Northern States we want a red clover which starts early, grows rapidly, has numerous erect stout stems which are not large. The plant should be smooth throughout, with thick leaves. The plant should endure dry weather well and seed freely.

I remember to have seen something written by an apiarist who spoke of breeding and selecting bees with a view to get those with tongues long enough to take nectar from the flowers of red clover.

To obtain this result, why not save seeds of the red clover from which some honey bees are seen to gather nectar? Plant the seeds apart from others and repeat the operation. Our ideal red clover then will have a short corolla to permit the visits of honey bees.

Since writing the above, I collected within about ten feet of each other some ripe heads of red clover from five different plants looking much alike. I selected fifty heads from each plant. The seeds were shelled and counted. Fifty heads contained 1,260 seeds, 1,275, 1,460, 1,485, 1,820 respectively. Between these two extremes is a difference of nearly one-third in the number of seeds. Mr. Troop selected a lot in another place, fifty heads of which contained 2,290 seeds, or nearly twice as much as the highest of those above mentioned. There is a marked difference in the color of seeds of different plants, though every seed in any one plant is not the color of every other seed. In some plants nearly all the seeds were a light yellow; in others purple on one side, while others were quite dark brown. Among those very dark were a few lighter in color.

WILL WHEAT TURN TO CHESS?

Of all the numerous farmers' institutes which I have attended scarcely one has adjourned without bringing up this subject. No other question has been so frequently asked. I have often been urged by the farmers to make experiments on the subject. Scarcely a harvest passes that some one does not send me a specimen or two for examination and explanation. Many of these have a few kernels of chess fastened to the spike of wheat by a breaking off of a part of the panicle of chess as it was pulled downwards and through or against the spike of wheat. A careful separation of the chaff of wheat has never failed to reveal the end of the branch of chess; yet there are many who stoutly maintain that they all grow from "the same head." One sample had a portion of a panicle of chess temporarily attached to the straw of wheat just below the spike. It entered the wheat straw and ran down about one inch, where it terminated abruptly. Another small stool of chess had an old shell of a wheat kernel held to the end of one of its roots which had grown in there by accident or for nourishment. I have many times sprouted chess, although there are farmers who say it will not grow. I have raised chess from chess, though there are many who maintain this cannot be done.

This season I pulled up from the apple orchard several stools of chess in flower or past this condition. They were placed in water till the next day. I spent about an hour making the examinations below described. A plant was washed under a pump till the roots were quite clean. The ends of the roots were cut off with shears after observing that there was nothing in the line of chess there. This shortened the size of the field for examination. In the first nine stools of chess thus examined, the old kernel of chess was still attached to the lower end of the ascending axis just where it should have been to produce the stool of chess. Something interrupted the work before completing the examination of other specimens. To be brief with these remarks we need careful observation of trained eyes instead of long discussions based on imaginary data, or data not well sustained by facts.

NOTES ON VARIETIES OF SORGHUM.

Except the seeds of *Sorghum vulgare,* all the following were received from the Department of Agriculture at Washington.

The season of 1882 was very backward and cool. Frost held off unusually late, which made the heat and length of summer nearly an average.

These seeds were planted on May 29th, in rows 10 feet in length, 3 feet apart, and 1½ feet in the rows.

On Oct. 23d the following notes were taken in regard to the growth of each variety:

"Early Amber."—Medium height (about 9 feet), rather slender, and nearly all ripe.

"Honey."—Large stalk, tall, and none of it ripe.

"Grey Top."—Large and stocky, medium height, and just in blossom.

"Sorghum vulgare."—Much like Early Amber, but earlier. Fully ripe.

"White Mammoth."—Large stalk, tall, and just in blossom.

"Neeazana."—Much like Early Amber, little taller, and only a little past flowering.

"African."—Much like Early Amber, a few stalks nearly ripe.

"Goose Neck."—Much like Early Amber, a little taller, and a few stalks nearly ripe.

"Stump."—Large stalk, quite tall, and none of it ripe.

"Siberian."—Large, stout stalks, but none of it ripe. Just in blossom.

"Link's Hybrid."—Stalks stout and tall, only just in blossom.

"Honduras."—Stalks very tall and a little past flowering.

"Miller."—Quite short and very slender, and all ripe.

The seeds for the first six of the following were brought in 1881 to the U. S. Agricultural Department by President James B. Angell, Minister to China.

No. 1. Slender, taller than Early Amber, a part of it ripe; stalks brittle, some of it broken down.

No. 2. Taller than Early Amber, much like it, nearly all ripe.

No. 3. Much like Early Amber, very tall, and only a little past flowering.

No. 4. Quite tall, slender, nearly all ripe.

No. 5. Very tall, and only half of it ripe.

No. 6. Very tall, a few stalks nearly ripe.

No. 29. Tall and slender, a third of it ripe.

No. 30. Medium size, a few stalks ripe.

FERTILIZING THE FLOWERS OF INDIAN CORN.

Stout paper sacks were drawn over several rudimentary ears before any silks or pistils had appeared above the husks. In all cases no kernels were formed. In two cases where the ear had been thus covered pollen was applied for self-fertilization. In one case a few kernels only were revived; in the other, no kernels were formed.

In case we do not wish the tassel of any stalk of corn to shed pollen, the tassel can be easily pulled out when young, as we frequently pull out the tops of young timothy or June grass.

IS THE UPPER EAR MORE VALUABLE THAN THE LOWER FOR SEED?

The following experiments were tried in 1881-2 for the purpose of determining whether seed corn saved from the upper ear of a stalk which bore two ears was any more productive than that saved from the lower ear.

In 1881 the seed from six ears of dent corn, which came from stalks bearing two ears each, was planted. The upper and lower ears were planted in alternate rows, so that each might receive the same treatment as nearly as possible. The rows contained nine hills, 3½ feet apart, and generally four stalks to the hill. The soil was quite poor and not manured very heavily.

On September 29th, 1881, the above was husked, and, in every case, the ears were larger from the seed from the upper ear than that from the lower, and generally more corn was produced. Only one stalk of the best lot was found that bore two ears. These were saved, and in the spring of 1882 this, together with several other lots, was planted in alternate rows in the same manner and on the same ground as the year before. Although the season has been very unfavorable, it has ripened, and on October 4th was examined, and the results are given in the following tables:

The seed for the following experiments was grown in 1881 from an upper ear:

No. of row.	Seed from upper ear. No. of stalk with two ears.	Seeds rom lower ear. No. of stalks with two ears.
1	8, and 16 rudiments, bearing silk.	
2		1, and 12 rudiments bearing silk.
3	0, and 13 “ “ “	
4		1, and 7 “ “
5	1, and 9 “ “ “	
6		1, and 9 “ “ “

Seed for the next plat was grown on the College farm.

1	2, and 22 rudiments with silk.	
2		0, and 13 rudiments with silk.
3	0, and 14 “ “ “	
4		0, and 7 “ “ “
5	0, and 12 “ “ “	
6		0, and 6 “ “ “

The seed of sweet corn was grown in 1881.

1	2, and 3 rudiments with silk,	
2		12, and 12 rudiments with silk.
3	5, and 6 “ “ “	
4		9. and 6 “ “ “
5	11, and 10 “ “ “	
6		11, and 9 “ “ “

One row, the seed of which was crossed with pollen from a barren stalk, has only six stalks. These have three good ears and one sucker with a nubbin. Why the seed failed in this row is not certainly known. Next to this were two rows, the seed of which was fertilized by pollen from the stalk which bore the seed of the previous row. One row had 21 good ears and 14 nubbins; the other has 11 good ears and 16 nubbins.

In these plats the four stalks to the hill and the poor condition of the ground probably prevented many ears from producing two ears each. The large number of rudimentary ears which put forth silk indicates that in the first two plats there is something in favor of seed saved from the upper ear.

The third plat reverses that idea to some extent. The experiment needs many repetitions on different seasons to enable us to reach exact conclusions.

ROOT-PRUNING INDIAN CORN.

In 1881, I made some experiments in root-pruning sweet corn in my own garden. I root-pruned at different distances from the hill, at different times during growth, generally three or more hills at a time. I watched the effect, and must say, so far as these experiments go, in the way in which I conducted root-pruning it appeared to decrease the yield in every case. I had carefully read the admirable essay on the subject by Dr. E. L. Sturtevant and tried to follow his directions.

IMPROVING INDIAN CORN.

For ten years or more I have advocated raising seed corn in a fertile field by itself where extra cultivation and care should be employed. All feeble stalks should be removed or have their tops cut off or pulled out before shedding any pollen on the ears to be used for seed.

In 1879, I selected a few fine ears from corn raised by Benjamin Hathaway of Little Prairie Ronde, Michigan. This is a very choice yellow dent variety, well adapted for the southern part of our State. I also selected a few fine ears of a yellow dent variety raised for five years by J. D. Adams of Climax, in Kalamazoo county. These two lots were much alike. They were planted on good soil in alternate rows. The poorest stalks were removed before flowering, and the tassels of *all* the Adams corn were pulled out when young. The result was some seed in autumn of 1879, the mother of which was the Adams corn, and the father of which was the Hathaway corn. Some of the best of this seed (and it was nice) was planted by itself in 1880; the small stalks were castrated; all were well cared for. In autumn of 1880 I had some of the finest corn ever grown at the College farm. From the best ear in 1881 I planted a small piece by itself. I selected an ear with a white cob. The ear was nearly cylindrical, not quite filled out at the tip, containing sixteen rows of kernels. The rows were quite straight and even. The kernels were well dented at the end; a few had rough points, though the ear was not rough to handle. The corn was bright, light yellow, the cob solid. The ear was selected for beauty, good proportions, and beauty and uniformity of kernels after shelling. While this corn was growing stalks were selected in the seed patch which resembled each other in most respects. They were marked and paper sacks drawn over the embryo ears. Pollen was artificially transferred several times. The two stalks or plants much resembling each other were mutually crossed, i. e., the pollen of number one was used on the pistils of number two, and vice versa.

Some twenty stalks were selected and numbered and inter-crossed by couples, as in the case above explained. Notwithstanding the corn all came from one ear, it varied considerably. The season was cool in the early part of 1881, and very hot and very dry during the latter portion. It was not a good year for corn. The corn was ripe about the 16th of September. For crossing, we selected early stalks which promised several ears. In most of these cases the upper ear was rather low down on the stalk. The top of the stalk was quite slender, the shanks of the ears rather long, tips of husks long. This selection for crossing did not prove a good one. My best ears were among the latest to mature. They had short shanks and short husks, and grew quite well up on the stalk. Although pollen was carried several times to fertilize a young ear, these ears seldom filled out completely. I consider kernels from such ears just as good for seed as though the ear had been well filled out. The absence of some kernels not fertilized allowed the rest to develop more perfectly. It would be like saving for planting the seeds from a few large apples where many apple blossoms in the vicinity on the tree had been removed to allow a few to develop more perfectly. Considering the season and the soil the corn was good. There was a tendency to a shortening of the kernels and early maturity.

After carefully husking and studying the corn, I decided to save an ear for seed in 1882 which had not been artificially crossed. I had been unable, while the corn was about to flower, to tell which were the best stalks.

This best ear of the crop of 1881 was the upper ear with a large rudimentary ear occupying the node below. This ear was four feet from the ground and came from the axil of the eighth leaf. The ear had a white cob, was nearly cylindrical, and had twenty rows of long kernels.

In 1882 a part of this ear was planted by itself on sandy land well fertilized by barn-yard manure plowed in, and later top-dressed with hen manure.

Attempts were again made in selecting, protecting, and inter-crossing similar stalks. The tips of all stalks not thought to be promising were pulled out before flowering. The plat of corn is much more uniform in quality and appearance than was on any previous plat on former years. The season in this part of central Michigan has been unprecedented for cool weather. Corn in all of this part of the State is very backward and much of it very small.

Since writing the above the corn has been husked, and was found better and much more uniform than on any former year. The best ear for seed next year, all things considered, was the upper ear where two ears grew on one stalk. It must be confessed that this ear grew on a stalk which we had not thought promising enough to cross by hand when it was in flower. In other words, I find it is not easy, when in flower, to tell just how a stalk will turn out.

Except in very rare cases, however, we were able to know enough to castrate all stalks which produced no ears or mere nubbins.

CROSSING CORN WITH FOREIGN STOCK.

Several of my previous reports or lectures at Farmers' Institutes has contained a detailed explanation of the meaning of this mode of crossing. In 1878 I reported some experiments made with Indian corn and with beans. The advantage shown by the crossing of corn over that not crossed was as 151 exceeds 100, and in the case of Black Wax beans it was as 236 exceeds 100. In 1879 and 1880 a similar experiment was made with Indian corn, showing that seed from crossed stock produced corn excelling that raised from uncrossed seed as 109 67-100 exceeds 100, or nearly ten per cent in favor of crossed stock.

In 1880 Professors C. L. Ingersoll, of Purdue University, Indianapolis; W. A. Henry, of Wisconsin University; C. C. Georgeson, of Texas Agricultural College; F. A. Gulley, of Mississippi Agricultural College; and W. J. Beal, of Michigan Agricultural College, agreed to unite and perform the same experiment on Indian corn.

Professors Ingersoll, Georgeson, and Gulley, for various reasons, did not succeed in the attempt. Professor Henry has not yet reported the results of his experiments which he has successfully carried out. Professor Beal, the writer, gives the results of his experiments a little further on in this report.

"Each man in his own State shall select two lots of seed corn, which are essentially alike in all respects. One should have been grown, at least, for five years, (better ten years or more), in one neighborhood, and the other in another neighborhood about 100 miles distant. In alternate rows plant the kernels taken from one or two ears of each lot. Before flowering, thin out all poor or inferior stalks. As soon as the tassels begin to show themselves in all the rows of one lot, pull them out, that all the kernels on the ears of those rows may certainly be crossed by pollen from the other rows. Save seeds thus crossed to plant the next year by the side of seeds of each parent. Seeds of one parent can be obtained from the rows not topped. Seeds of the other parent should be planted by themselves to get pure seeds of the same year. For the second year treat all lots alike as nearly as possible."

For further details of the plan, consult page 287 of the Report of the Michigan Board of Agriculture for 1880.

In the spring of 1881 I obtained two lots of white flint corn, one from Oakland county, by the kindness of Wm. Caldwell; the other from Allegan county, by the kindness of L. A. Lillie. The corn from Oakland county had been raised for ten years on one farm; that from Allegan, six years in the same vicinity.

In one lot of rows of the Allegan and Oakland county corn, all of the Allegan corn was castrated. Castration, or the removal of the tassels from stalks has been found to cause the ears to grow larger than they otherwise would. Still, with castration in favor of the Allegan corn, it did not produce ears which were so large or evenly developed as did the corn from Oakland county. The Oakland county seed corn was the better of the two. Owing to an accident we failed to raise any pure Allegan county seed in 1881. The "crossed corn" was only compared with pure Oakland county seed raised last year at the College.

In the spring of 1882, on good soil in a portion of the vegetable garden, three rows of "crossed seed" were planted in rows alternating with three other rows of pure Oakland county seed of 1881. By an oversight each row of each lot was not kept separate. The pure seed yielded 57½ pounds in the ear; the "crossed seed" yielded 69½ pounds in the ear. In other words, the crossed stock exceeded the pure stock as 121 exceeds 100, nearly.

HOW ROOTS BEHAVE.

The following is a short abstract of some experiments made in 1881 and 1882. Papers were read on the subject at the Cincinnati and the Montreal meetings of the American Association for the Advancement of Science:

Darwin says roots circumnutate downwards, i. e., they swing around as they descend. He placed sprouting kernels over water in the dark and on one side of the root tip placed a small piece of gummed paper. He thus induced the root to bend out of its course, often making a revolution or coil, or in one case even tying itself into a knot.

By sprouting corn in a similar manner, using hundreds of kernels of different varieties and different ages, I found that the roots of corn would make coils without any gummed paper on the tip—that some of these roots went off without support for three inches in a horizontal direction, some obliquely upwards, and a few went straight up; some making curves, some one, two, or even three coils.

Of my improved dent corn of last year's growth I experimented on 700 or more kernels as follows: Some were examined where they had sprouted in the garden; some in rich soil; some in poor soil; some in sand in a damp cellar. The primary and secondary roots, from one to six for each kernel, about 3,000 roots were examined, and not a single instance was found of a coil in the root. In a damp cellar facing the north, with the thermometer about 65° to 70° F., I placed a box of poor damp sand, having a level surface. Some kernels were planted with the tips down, some with the tips up. In many cases roots came out of the sand.

There were more roots out of the ground than there were kernels planted. In one lot of 181 kernels the tips were planted uppermost and covered one-half inch deep and patted as with a hoe. When the tops of the young plants were about four inches high they were examined. Of these, 89 sent the primary root out of the sand, 93 did not send it out. Many of those sent out re-entered the sand. Some went out and in the sand several times. Above ground the roots were somewhat red in color. The air was damp enough so that root hairs thrived on roots above the sand as well as in the sand.

When planted with the tip of the kernel down, a small per cent sent the primary root out of the sand. The primary roots kept ahead of the secondary roots, even if they were on the surface of the sand, for twelve or fourteen inches. In the cellar the roots apparently grew on the surface of the sand as well as they did beneath the surface.

Experiments with corn planted in the garden showed that primary and secondary roots often come out on the surface or to the surface if the surface was damp. Here the tips of the roots perished. When the sand was dry on the surface, the tips of roots were often found killed where they had attempted to grow upwards.

Lima beans were planted in the sand in the cellar and in the open garden. Some were planted with the eye uppermost, some with the eye downward. Those with the eye uppermost appeared a good deal confused, and many of them never got the leaves above ground. Nine out of twenty-five in the garden with the eye uppermost sent, in damp weather, the root end of the stem, with all the roots, directly up out of the ground, where they perished.

From these experiments it seems that Indian corn and Lima beans in germination do not, by any means, send all of their roots or radicles below the surface of the ground. Roots and radicles often go in the direction of least resistance.

MEASURING ALTERNATE ROWS OF CROPS WHERE THE CONDITIONS ARE APPARENTLY UNIFORM.

It is very frequently the case that people make experiments by using some fertilizer or other different mode of treatment on rows alternating with those treated in the ordinary manner. A little difference in the yield of the alternate rows is attributed to the use of the special fertilizer or the special cultivation or other treatment.

In 1881 my assistant selected five rows of yellow Danvers onions. These were fourteen inches apart, and were contiguous rows of the same length running across the patch of ground which had been used several years for onions. The rows were selected because they seemed to be of uniform quality and productiveness, and had been treated in the same manner.

The first row yielded	6½ bushels.
The second row yielded	5¾ bushels.
The third row yielded	6½ bushels.
The fourth row yielded	4½ bushels.
The fifth row yielded	5 bushels.

Suppose rows numbers 1 and 3, alternating with 2 and 4, be compared. We get a yield of 13 and 10¼ bushels respectively, quite a marked difference, for which we can give no reason.

We easily see that we may place too much stress on results obtained where rows alternate with each other.

An accident in 1882 prevented me from adding other examples of the yield of long rows of onions which were alike in all respects, so far as we could observe.

WILL THE POLLEN FROM ONE VARIETY OF APPLE CHANGE THE APPEARANCE OF ANOTHER VARIETY?

It is not an uncommon thing to see an apple of a kind which is usually smooth, bearing stripes of russet from the stem to the blossom end, or calyx. This russet stripe has often been considered an evidence of a cross, or a partial cross by pollen from a russet variety.

On examining several such apples I cannot now remember to have seen a single one where the russet stripe corresponded to a carpel of the apple. This we should expect in case the russet stripe was due to russet pollen. A few years ago I crossed some smooth apples (when in flower) with pollen from a russet tree. No effect was produced. In 1881 this experiment was repeated. Pollen of the flowers of Northern Spy and Golden Russet were interchanged or reversed on the stigmas. In no case was there any indication of russet on the skin of Spy apples, where russet pollen had been used on the flowers.

There was no change of the color of the skin of the Russet apples where pollen from Spy flowers was used.

I think the russet stripes found on apples which are usually smooth are to be attributed to what we call a sport. In other words, we cannot account for the russet stripes.

OUR NEW VARIETIES OF FRUITS.

During the past ten years I have several times crossed the flowers of several of our cultivated and wild fruits. I have spoken in my previous reports of the new varieties obtained. None of the apples, pears, quinces, grapes, plums, or cherries have yet produced fruit. This year a new lot of strawberries fruited. Some of them are nice, and will be further tested. To be worthy of a name, they must be better than anything now known. This is not probable. Some gooseberries, raspberries, and currants have fruited. These are worthy of a further trial, as frost in the spring killed most of the flowers.

WILL POSTS SET "TOP END DOWN" OUTLAST THOSE SET TOP END UP?

It is firmly believed by many persons that posts set in the ground in a position the "reverse" which they stood while growing in the tree, will last much longer than when set "top end up." In the spring of 1879 I selected seasoned sticks three feet long. These were split in two, and then cut in two crosswise, making four pieces of each. One set was placed in well drained sand, the other in clay soil. In every case two pieces were set side by side, with earth between, one as it stood in the tree, the other reversed. I tried thirteen kinds of timber. Some of these were young wood with the bark on. All contained some heart wood. Those set in sand were examined in autumn of 1881. In case of the beech, sugar maple, ironwood, black ash, and black cherry, the piece reversed or placed "top end down" was somewhat most decayed. In case of red maple, American elm, bitternut, and red elm, the piece set "bottom end down" was a trifle the most decayed. In case of basswood, white ash, white oak, and blue ash, there was no perceptible difference.

In autumn, of 1882, the posts set in clay soil were examined. In case of the red maple, sugar maple, American elm, basswood, bitternut, réd elm, the piece set "top end down" was most decayed. In case of beech, white ash, black ash, black cherry, the piece set "bottom end down" was most decayed. In case of ironwood, white oak, blue ash, there was no perceptible difference.

I infer that where one piece decayed more than the other it was caused by some trifling difference in the sticks. The freshly sawed ends in each case were placed uppermost, and came an inch or two above the ground.

In some cases one-half of a stick (one piece certainly the reverse of the other) lasted considerably better than its other half. As will be seen, it was sometimes the "top end down" which lasted better, sometimes the "bottom end down," and in some cases there was no difference in durability.

MUSEUM OF VEGETABLE PRODUCTS.

During the summer of 1882, four fine, upright cases, fronting both ways, were placed in the museum. The total length is nearly 50 feet. They were constructed by C. H. Mann, of Lansing, Michigan. One of the cases is already filled with Indian corn, the samples coming from various parts of North America.

THE ARBORETUM.

I had intended to measure some of the trees and make quite a detailed report of those promising the best results when cultivated for timber or ornament, but owing to the great length of my report this idea has been abandoned.

The arboretum is about one and one-half acres in extent, and contains 152 species of trees and shrubs. It was begun in the summer of 1875, and has twice been enlarged. At the south end of each row, or part of a row, will soon be placed a locust label which contains the scientific name and the common name, together with the date and manner of planting. I have been Professor of Botany in this College for 12 years, and Professor of Horticulture for 10 years; I have taken a deep interest in many things pertaining to both of these departments. I have made some experiments, but on looking back over the whole period at my work, I can see nothing which gives me greater satisfaction, or which is likely to prove of more interest to our farmers, considering the means expended, than this little arboretum. The trees are growing, some of them with great rapidity, and a detailed report will be of more interest two years hence than at this time.

Aside from fruit trees the arboretum and lawns must contain not far from 250 species and named varieties of trees and shrubs. These, or samples of all these, are accurately labeled.

THE BOTANIC GARDEN.

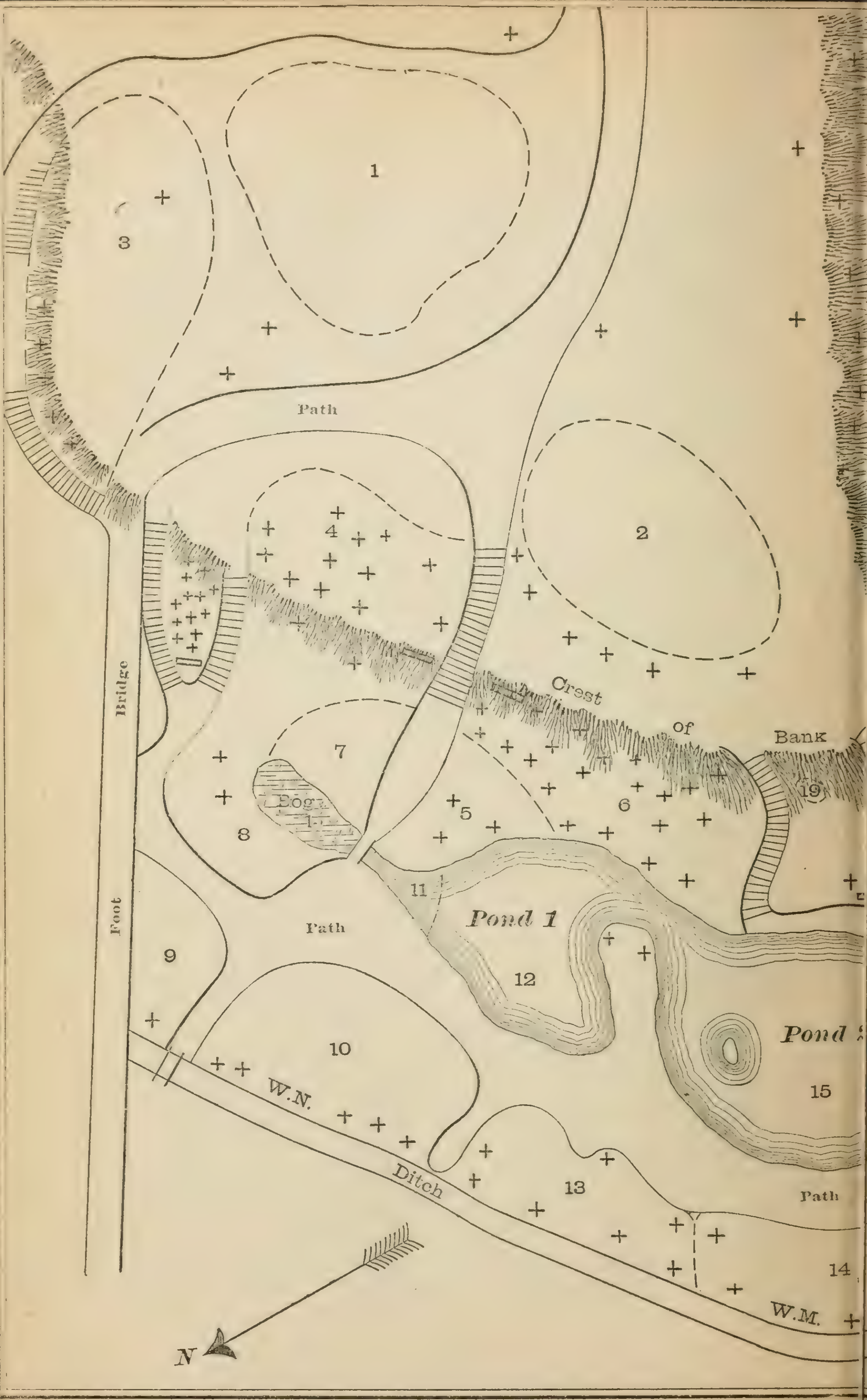
So far as use to the botanist is concerned, the plats of grasses and clovers, the arboretum, the trees and other plants on the lawns, the cultivated plants in the gardens, orchards, and vineyards, the plants in the greenhouses might all well be considered as forming a botanic garden; but the present part of this report refers to an irregular plat of ground containing about one-third of an acre, situated between the greenhouse and the botanical laboratory.

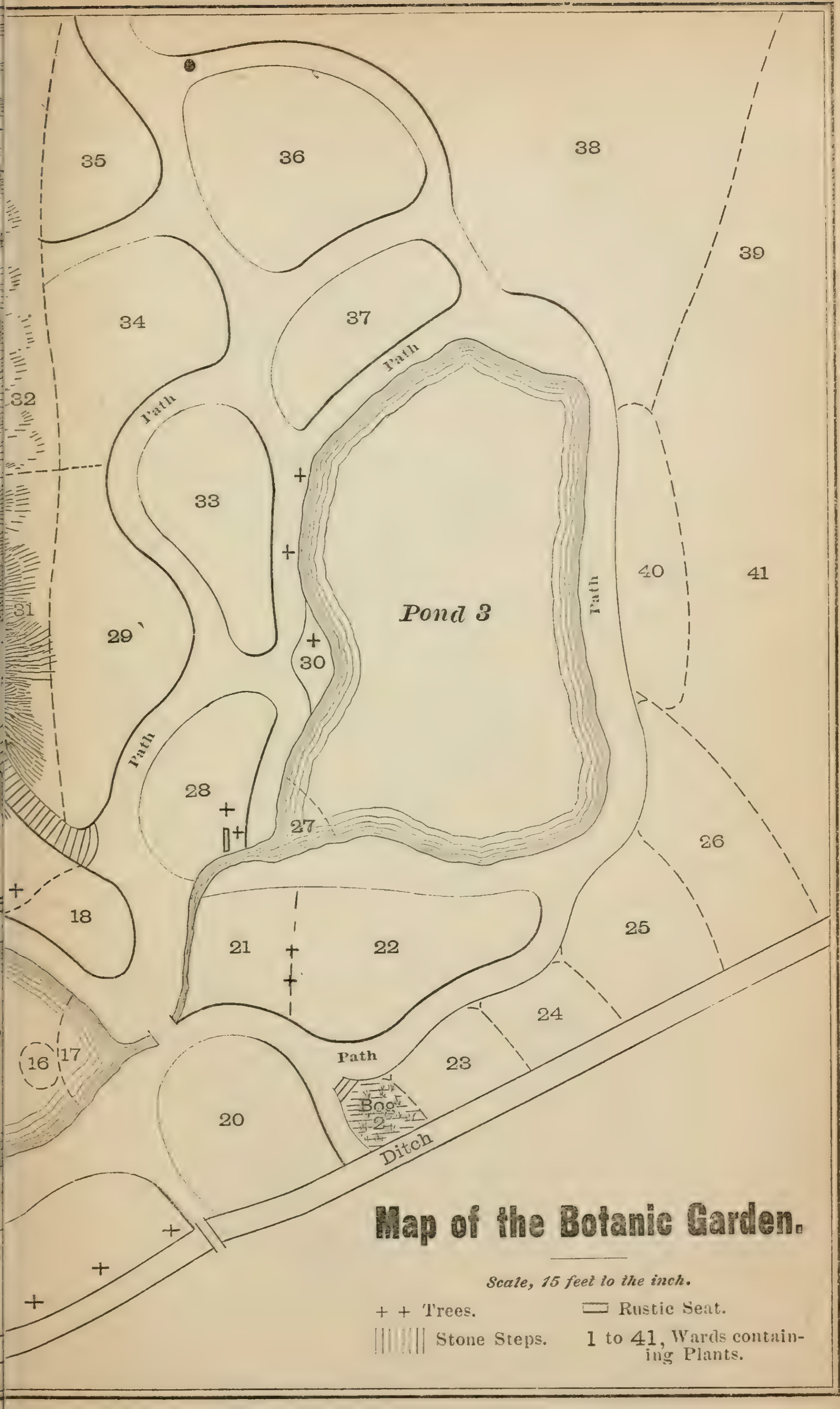
As will be seen by consulting the map accompanying this report, the garden is situated just east of the brook which runs south into the Cedar river.

The brook has been deepened so the plats are generally well drained. A cut-off from this brook, some 20 rods above, supplies water to three ponds. Connected with these ponds and the brook are several bogs, some exposed to sun, others are deeply shaded. A little to the southeast of the brook is a bank well supplied with small trees in great variety. These are mostly natives, and stand where nature planted them. As they grew larger they have been gradually thinned to prevent crowding and running up tall, and to leave room for some light to sustain the herbaceous plants.

To the north of the garden a rustic foot-bridge spans the ravine. Boulders of various sizes have been used along the banks to form steps and seats, and pockets for plants. Among the trees and plants, the little rivulets and ponds, the banks, bogs, and plats, paths wind irregularly about. In several places rustic seats have been constructed.

This small garden contains not far from 700 species of flowering plants, a large portion of which are our native perennial herbs. Within the past two years the garden has been considerably enlarged. In fact, it has been growing every year since it was first started, in 1877. It is now divided into what are termed "wards." These are of various sizes and shapes, and are 41 in number. They are mostly bounded by the brook, the ponds, paths, or a low border of small stones. Each ward contains plants belonging to one, two, or more natural orders or families. The herbaceous plants of each family are placed together. A label of locust wood stands near each plant. The wards are numbered as they are on the map, and a large label in each ward gives the names of the families contained within its borders. An alphabetical catalogue containing scientific and common names accompanies this report. Opposite the name of every plant is a number which refers to the


1
3
2
Path
4
Crest of Bank
19
7
Bog
8
5
6
11
Pond 1
Path
9
12
10
Pond
15
W.N. Ditch
13
Path
14
W.M.
Foot Bridge
N



Map of the Botanic Garden.

Scale, 15 feet to the inch.

+ + Trees.

▭ Rustic Seat.

||||||| Stone Steps.

1 to 41, Wards containing Plants.

number of the ward where the plant may be seen near its label. Except in a few cases little attempt has been made to place next to each other the families which are nearest related, but considerable study has been devoted to finding a place of suitable size, soil, light, shade, and moisture to suit all the plants of each family here represented. The semi-rustic condition of the garden, the variety of views, the number of plants make it a favorite resort for all lovers of nature. Especially is this the case with all who are interested in botany. The work has all been done by students under my oversight. With one exception no student has had the work in charge more than one year at a time, and in some cases not more than one or two terms. This has made it necessary for me to look after many details of arrangements, labels, and additions.

The following numbers of wards or divisions of the Botanic Garden contain plants belonging to the families set opposite them:

No. 1.	Leguminosæ, *Pulse Family.*
	Polygalaceæ, *Milkwort Family.*
No. 2.	Caryophyllaceæ, *Pink Family.*
	Verbenaceæ, *Vervain Family.*
	Crassulaceæ, *Orpine Family.*
No. 3.	Rosaceæ, *Rose Family.*
	Calycanthaceæ, *Colycanthus Family.*
	Portulacaceæ, *Purslane Family.*
No. 4.	Euphorbiaceæ, *Spurge Family.*
No. 5.	Orchidaceæ, *Orchis Family.*
No. 6.	Aristolochiaceæ, *Birthwort Family.*
No. 7.	Saxifragaceæ, *Saxifrage Family.*
	Sarraceniaceæ, *Pitcher-Plants.*
	Droseraceæ, *Sundew Family.*
No. 8.	Ranunculaceæ, *Crowfoot Family.*
No. 9.	Malvaceæ, *Mallow Family.*
No. 10.	Liliaceæ, *Lily Family.*
No. 11.	Saururaceæ, *Lizard's-tail Family.*
No. 12.	Typhaceæ, *Cat-tail Family.*
	Lemnaceæ, *Duckweed Family.*
No. 13.	Filices, *Ferns.*
	Equisetaceæ, *Horsetail Family, Scouring Rushes.*
	Lycopodiaceæ, *Club-Moss Family.*
No. 14.	Labiateæ, *Mint Family.*
No. 15.	Nymphæaceæ, *Water-lily Family.*
	Pontederiaceæ, *Pickerel-weed Family.*
	Hydrocharidaceæ, *Frog's-bit Family.*
No. 16.	Anacardiaceæ, *Cashew Family.*
	Poison Ivy and Poison Sumach on an island.
No. 17.	Araceæ, *Arum Family.*
	Alismaceæ, *Water-Plantain Family.*
No. 18.	Berberidaceæ, *Barberry Family.*
	Papaveraceæ, *Poppy Family.*
	Plumbaginaceæ, *Leadwort Family.*
	Fumariaceæ, *Fumitory Family.*
No. 19.	Cactaceæ, *Cactus Family.*

No. 20.	Iridaceæ, *Iris Family.*
	Commelynaceæ, *Spiderwort Family.*
	Lobeliaceæ, *Lobelia Family.*
	Campanulaceæ, *Campanula Family.*
No. 21.	Ericaceæ, *Heath Family.*
	Violaceæ, *Violet Family.*
	Vitaceæ, *Vine Family.*
No. 22.	Solanaceæ, *Nightshade Family.*
	Urticaceæ, *Nettle Family.*
	Chenopodiaceæ, *Goosefoot Family.*
	Amarantaceæ, *Amaranth Family.*
	Hydrophyllaceæ, *Waterleaf Family.*
No. 23.	Linaceæ, *Flax Family.*
	Geraniaceæ, *Geranium Family.*
	Rhamnaceæ, *Buckthorn Family.*
	Convolvulaceæ, *ConvolvulusFamily.*
No. 24.	Aquifoliaceæ, *Holly Family.*
	Gentianaceæ, *Gentian Family,*
	Primulaceæ, *Primrose Family.*
	Hypericaceæ, *St. John's wort Family.*
No. 25.	Cruciferæ, *Mustard Family.*
	Borraginaceæ, *Borage Family.*
	Polygonaceæ, *Buckwheat Family.*
No. 26.	Caprifoliaceæ, *Honeysuckle Family.*
	Celastraceæ, *Staff-tree Family.*
No. 27.	Naiadaceæ, *Pondweed Family.*
	Lentibulaceæ, *Bladderwort Family.*
No. 28.	Umbelliferæ, *Parsley Family.*
	Araliaceæ, *GinsengFamily.*
	Onagraceæ, *Evening Primrose Family.*
	Lythraceæ, *Loosestrife Family.*
No. 29.	Scrophulariaceæ, *Figwort Family.*
	Valerianaceæ, *Valerian Family.*
	Dipsaceæ, *Teasel Family.*
	Plantaginaceæ, *Plantain Family.*
	Polemoniaceæ, *Polemonium Family.*
No. 30.	Rutaceæ, *Rue Family.*
	Menispermaceæ, *Moonseed Family.*
No. 31.	Smilaceæ, *Smilax Family.*
No. 32.	Asclepiadaceæ, *Milkweed Family.*
	Apocynaceæ, *Dogbane Family.*
Nos. 33, 34, 35, 36, 37.	Compositæ, *Composite Family.*
No. 38.	Gramineæ, *Grass Family.*
	Cyperaceæ, *Sedge Family.*
	Juncaceæ, *Rush Family.*
No. 39.	Cornaceæ, *Dogwood Family.*
No. 40.	Cucurbitaceæ, *Gourd Family.*
	Rubiaceæ, *Madder Family.*
	Dioscoreaceæ, *Yam Family.*
	Phytolaccaceæ, *Pokeweed Family.*

AN ALPHABETICAL LIST OF THE PLANTS IN THE BOTANICAL GARDEN.

The number following each name refers to the number of the ward as given on the map:

Acer Spicatum, Lam.
" dasycarpum, Ehrhart, 13, near 18.
" rubrum, L., 3.
Achillea millefolium, L., 33.
" " Var. rubrum, L., 33.
Acnida tuberculata, L., 22.
Aconitum variegatum, 8.
Acorus Calamus, L., 17.
Actea alba, Bigel, 8.
" spicata, L., 8.
Adder's Tongue, Smith, 10.
Adiantum pedatum, L., 13.
Adlumia cirrhosa, Raf., 18.
Agrimonia Eupatoria, L., 3.
" parviflora, Ait., 3.
Agrimony, Tourn., 3.
Agrostis alba, L., 38.
" scabra, Willd., 38.
" canina, L., 38.
" vulgaris, With., 38.
Ajuga reptans, L.
Alder, 13.
Alexanders, 28.
Alisma Plantago, L., 17.
Allium Canadense, Kalm, 10.
" carinatum, L., 10.
" cernuum, Roth, 10.
" pistulosum, 10.
" Molle, ?, 10.
" Sphærocephalum, L., 10.
Alnus serrulata, Ait., 13.
Alopecurus aristulatus, Mx., 38.
Alyssum maritimum, L., 25.
Alum-root, L., 7.
Amarantus retroflexus, L., 22.
Ambrosia trifida, L., 36.
" artemisiæfolia, L., 36.
Amelanchier Canadensis, Torr. and Gray, 6.
Amorpha fruticosa, L., 1.
Ampelopsis Vetchii 21.
" quinquefolia, Mx., 21.
Amphicarpæa monoica, Nutt., 1.
Anacharis Canadensis, Planchon. Pond, 2.
Andropogon furcatus, Muhl., 38.
Anemone cylindrica, Gray, 8.
" dichotoma, L., 8.
" hepatica, L., 8.
" multifida, Poir., 8.
" sylvestris, L., 8.
" thalictroides, L., 8.
" acutiloba, Law., 8.
Anthesisum liliustreum, Var. Fraseri.
Apios tuberosa, Mœnch., 1.
Aplectrum hyemale, Nutt., 5.
Apple, Tourn., 8.
Apocynum androsæmeifolium, L., 32.
" Cannabinum, L., 32.
Aquilegia, Tourn., 8.
" Canadensis, L., 8.
" chrysantha, Gr., 8.
" ? 8.
Arabis albida, Slev., 25.
" Canadensis, L., 25.
Aralia nudicaulis, L., 28.
" racemosus, L., 28.
" ? 28.
" quinquefolia, L., 28.
" trifolia, L., 28.
Arborvitæ, L., 6, 10, 13, 32.
Archangelica atropurpurea, Hoffm., 28.
Arenaria stricta, Mx., 2.
Arisæma Dracontium, Schott., 17.
" triphyllum, Torr., 10.
Aristolochia sipha, L'Her., 6.
Armeria elongata, Hoffm., 18.
" maritima, Willd., 18.
Arrow-head, arrow-leaf, L., 17.
Arrow-wood, L., 26.
Artemisia pontica, 33.
" absinthium, L., 33.
Asarum Canadense, L., 6.
Asclepias Cornuti, Decaisne, 32.
" incarnata, L., 32.
" phytolaccoides, Pursh, 32.
" tuberosa, L., 32.
" ? L., 32.
Ash, black, Lam., 7.
" red, Lam., near 18.
" white, L., 3.
Asparagus officinalis, L., 10.

Aspen, Tourn, 4.
Aspidium acrostichoides, Swartz, 13.
“ cristatum, Swartz, 13.
“ Goldianum, Hook., 13.
“ marginale, Swartz, 13.
“ spinulosum, Swartz, 13.
“ Noveboracense, Swartz, 13.
“ Thelypteris, Swartz, 13.
Asplenium angustifolium, Mx., 13.
“ ebeneum, Ait., 13.
“ Filix-fœmina, Bernh., 13.
Astragalus Canadensis, L., 1.
“ Cooperi, Gray, 1.
Asters, 34.
Aster lævis, L., 34.
“ leucanthemus, Desf., 34.
“ macrophyllus, L., 34.
“ Tradescanti, L., 34.
“ corymbosus, Ait., 34.
“ sericeus, Vent., 34.
“ cordifolius, L., 34.
“ miser, L., Ait., 34.
“ carneus, Nees., 34.
“ longifolius, Lam., 34.
“ puniceus, Lam., 34.
“ Novæ-Angliæ, L., 34.
Avens, L., 3.
Azalia pontica, L., 21.
Bald cypress, Richard, 26.
Balm of gilead, L., 3.
Barren strawberry, Tratt., 3.
Barberry, L., 18.
Baneberry, L., 8.
Baptisia tinctoria, R. Br., 1.
Basswood, L., 3
Beach Pea, Big. w, 1.
Beech, Tourn.,elo
Bedstraw, L., 6.
Bean, L., 1. 40.
Bellflower, Tourn., 20.
Bellwort, L.,10.
Berberis vulgaris, L., 18.
Betula alba, Spach., 9.
Birch, (white), Spach., 9.
Bittersweet, L., 22.
Bittersweet, (shrubby), L., 26.
Bitter vetch, Tourn., 1.
Bitternut, Nutt.
Black ash, Lam., 7.
Blackberry, L., 3.
Black cherry, Ehrhart, 3, 6.
Black currant, L., 7.
Black medick, L., 1.
Black walnut, L.,southwest, near river.
Bladder nut, L.
Bladderwort, L., 27.
Bleeding heart, Borkh., 18.
Blephilia ciliata, Raf., 14.
Blephilia hirsuta, Benth., 14.
Blitum capitatum, L., 22.
Bloodroot, L., 18.
Blue beech, Mx., 4, 6.
Blue berry, L., 2, 21.
Blue cohosh, Mx., 8.
Blue flag, L., 20.
Blue grass, L., 38.
Blue joint, Beauv., 38.
Boneset, L., 37.
Botrychium ternatum, Swartz, 13.
Botrychium virginicum, Swartz, 13.
Bottlebrush grass, Schreb., 38.
Box elder, Mœnch., 13.
Brachyelytrum aristatum, Beaur., 38.
Brake, L., 8.
Brasenia peltata, Pursh., pond 23.
Brassica sinapistrum, L., 25.
Bromus Kalmii, Gray, 38.
Bromus ciliatus, L., 38.
Brown Bent Grass, L., 38.
Brunella vulgaris, L., 14.
Buck bean, Tourn, 11, 24.
Buckthorn, L., 10.
Buckwheat, Mœnch., 25.
Bulrush, L., 38.
Burdock, Tourn., 33.
Burning bush, Jacq., 26.
Bur oak, Mx., 14.
Bur-reed, Tourn., pond 1, No. 13.
Bush clover, Mx., 1.
Buttonwood, L., south, near river.
Cactus, 19.
Calla pulustris, L., 17.
Caltha pulustris, L., 8.
Calamagrostis Canadensis, Beauv., 38.
Calycanthus lævigatus, Willd., 3.
Campanula allariæfolia, W., 20.
“ Americana, L., 20.
“ macrantha, Bot. mag., 20.
“ rotundifolia, L., 20.
“ rapunculoides, 8, 21.
Canada thistle, Scop., 33.
Candy tuft, L., 25.

Cannabis sativa, L., 22.
Capsulla Bursa pestoris, Moench., 25.
Cardamine purpurea, Torr., 25.
Cardinal Flower, L., 20.
Carex, 20 sp's, 38.
Carpinus Americana, Mx., 6.
Carrot, L., 28.
Carya alba, Nutt., southwest of laboratory.
Carya amara, Nutt., north of 8, across brook.
Cassandra calyculata, Don., 21.
Cassia Marilandica, L., 1.
Catalpa speciosa, Warder, 8.
Catnip, L., 14.
Cat-tail, L., 12.
Caulophyllum thalictroides, Mx., 8.
Celastrus scandens, L., 26.
Celtis occidentalis, L., 31.
Cephalanthus occidentalis, L., 40.
Cerastium arvense, var. Andrewsi, L., 21.
Charlock, L., 25.
Chelidonium majus, L., 18.
Chelone glabra, L., 29.
Chelone Lyoni, L., 29.
Chenopodium album, L., 22.
“ glaucum, L., 22.
“ hybridum, L., 22.
“ Botrys, L., 22.
Cherry (choke), L., 3.
Cherry (black), Ehrhart, 3.
Chicory, Tourn., 33.
Chickweed, Smith, 2.
Chimaphila umbellata, Nutt., 21.
Chokeberry, L., 3.
Chrysosplenium Americanum, Schwein., 7.
Cichorium Intybus, L., 33.
Cicuta maculata, L., 28.
Cimicifuga racemosa, Ell., 8.
Cinna arundinacea, L., 38.
Claytonia virginica, L., 3.
Clematis pitcheri, Torr. and Gray, 8.
Clematis Virginiana, L., 8.
“ ? 8.
“ ? 8.
“ viticella, T. & G., 8.
Cleanothus Americanus, L., 23.
Climbing Rose, 3.
Clovers, L., 1.

Cnicus lanceolatus, Scop., 33.
“ altissimus, Spreng., 33.
“ muticum, Mx., 33.
“ arvensis, Scop., 53.
Collinsia verna, Nutt., 14.
Collinsonia Canadensis, L., 14.
Comfrey, L., 25.
Compass-plant, L., 36.
Conium variegatum, L., 28.
“ maculatum, L., 28.
Convallaria majalis, L., 10.
Convolvulus sepium, Br., 23.
Coptis trifolia, Salisb., 8.
Coreopsis lanceolatum, L., 33.
“ aristosa, Mx., 33.
Cornus circinata, L'Her., 39.
“ alternifolia, L., 39.
“ florida, L., 39.
“ paniculata, L'Her., 39.
“ sericea, L., 39.
“ stolonifera, Mx., 39.
Corylus Americana, Walt.
Cotton, 9.
Cranberry, L., 21.
Crane's bill, L., 23.
Cratægus, ? 21.
“ ? 21.
“ tomentosa, L., 21.
Creeping Thyme, L., 14.
Cress, L., 25.
Crowfoots, L., 8.
Cucumber root, Gronov., 10.
Culver's Physic, L., 28.
Cupressus thyoides, L.
Cuscuta Gronovii, Willd., 23.
Cyperus, 5 species, L., 38.
Cypripedium pubescens, Willd., 5.
“ parviflorum, Salisb., 5.
“ spectabile, Swartz, 5.
Cystopteris bulbifera, Burnh., 13.
“ bragilis, Burnh., 13.
Dandelion, Desf., 33.
Danthonia spicata, Beauv., 38.
Daucus carota, L., 28.
Delphinium cheilanthum, L., 8.
Dentaria diphylla, L., 25.
“ laciniata, Muhl., 25.
Desdemonium, sp's, 1.
Desmodium Canadense, DC., 1.
Dewberry, L., 3.
Dianthus Cruciatus, SM., 2.

Dianthus deltoides, L., 2.
" furcatus, Bolb., 2.
" vicidus, W. & R., 2.
Dicentra Cucullaria, DC., 18.
" spectabolis, Borkh., 10.
" Canadensis, DC., 18.
Diervilla trifida, Mœnch., 26.
Dioscorea villosa, L., 40.
Diplopappus umbellatus, T. & G., 34.
Dipsacus laciniatus, 29.
Dirca palustris, L., 26.
Dock, L., 25.
Dodder, Tourn., 23.
Dogbane, Tourn., 32.
Dogfennel, 33.
Dogstooth violet, L., 10.
Dogwood, L., 39.
Drosera rotundifolia, L., Bog 1.
Ducksmeat, L., Pond 1.
Dulichium spathaceum, Pers., 38.
Dutchman's breeches, DC., 18.
" pipe, L'Her., 6.
Dwarf cherry, L., 3,
Eatonia Pennsylvanica, Gray, 38.
" obtusata, Gray, 38.
Echinocystis lobata, T. & G., 40.
Elder, L., 26.
Elecampane, L., 36.
Eleocharis, sp's, R. Br., 38.
Elm, L., 21.
Elymus Virginicus, L., 38.
" Canadensis, L., 38.
" Striatus, Willd., 38.
Epigæa repens, L., 21.
Epilobium spicatum,, Lam. 28.
" coloratum, Muhl., 28.
Epimedium alpinum, L., 18.
" rubrum, 18.
Equisetum, sp's, 3, L., 13.
Erigenă bulbosa, Nutt., 28.
Eriophorum, sp's, L., 38,
Eryngium planum, Moth., 28.
Erythronium Americanum, Smith, 10.
Euonymus atropurpureus, Jacq., 26.
" Americanus, L., 38.
Eupatorium ageratoides, L., 38.
" aromaticum. L,, 38.
" perfoliatum, L., 38.
" purpureum, L., 38.
Euphorbia corollata, L., 4.
" Cyparissias, L., 4.
Evening Primrose, L., 28.
Fagus ferruginea, Ait., 6.
Fagopyrum esculentum, Moench., 25.
False Meadow Rue, 18.
False Solomon's Seal, Desf., 10.
Ferns, 13.
Festuca nutans, Willd., 38.
" ovina, L., 38.
Figwort, L., 29.
Fivefinger, L., 3.
Flax, L., 23.
Floerkea proserpinacoides, Willd., 23.
Flowering Fern, L., 13.
Forget-me-not, With., 25.
Fragaria Virginiana, Ehrhart, 3.
Fraxinus Sambucifolia, Lam., 7.
" pubescens, Lam., near 18.
" Americana, L., 3.
Funkia ovata, Spr., 10.
" " Var. alba-marginata, Spreng., 10.
Funkia subcordata, Spreng., 10.
Galium verum, L., 40.
" boreale, L., 40.
Gaultheria procumbens, L., 21.
Gaylussacia resinosa, T. & G., 21.
Gentiana Andrewsii, Griseb., 24.
Gentiana Crinita, Froel.
Geranium Carolnianum, L., 23.
" maculatum, L., 23.
" purpureum, Jord., 23.
Gerardia, 5 sp's, L., 29.
Germander speedwell, L., 29.
Geum album, Gmelin., 3.
" rivale, L., 3.
Ginseng, Decaisne, & Pl., 28.
Glyceria Canadensis, Trin., 38.
" nervata, Trin., 38.
" aquatica, Smith, 38.
" fluitans, R. Br., 38.
Golden Alexanders, 28.
Golden rod, L., 34.
Goodyera pubescens, R. Br., 5.
" repens, R. Br., 5.
Green briar, L., 31.
Ground cherry, L., 22.
Ground nut, Moench., 1, 39.
Gymnostichum, Hystrix. Schreb., 38.
Habenaria psycodes, 5.
" viridis Var. bracteata, Br., 5.
" lacera, 5.

Hackberry, L., 31.
Hair Grass, L., 38.
Hamamelis Virginica, L., 6.
Hawk-weed, Mx., 33.
Hawthorn, L., 3, 21.
Hazelnut, Walt.
Hedeoma pulegioides, Pers., 14.
Hedge nettle, L., 14.
Helenium autumnale, L., 33.
Helianthus annus, L., 35.
“ tuberosus, L., 35.
“ divaricatus, L., 35.
“ giganteus, L., 35.
“ grosse-serratus, Martens, 35.
Heliopsis, ? 36.
Hemerocallis flava, L., 10.
“ fulva, L., 10.
“ graminea, 10.
Hemlock, L., 3, 4, 9, 31.
Hemp, L., 22.
Hepaticas, Dill., 8.
Heuchera cylindrica, 7.
“ hispida, Pursh., 7.
“ pilocisina, 7.
Hibiscus militaris, Cav., 9.
“ ?
“ moscheutos, L., 9.
Hieracium repens, W., 33.
“ venosum, L., 33.
Holcus lanatus, L., 38.
Honeysuckle, Ait., 26.
Hop, L., 22.
Hop clover, 1.
Hop-tree, L., 30.
Hordeum jubatum, L., 38.
Horehound, L., 14.
Hornbean, Mx., 6.
Horse-balm, L., 14.
Horse-mint, L., 14.
Horse-radish, Fries., 25.
Houstonia purpurea var. longifolia, L., 40.
Huckleberry, T. & G., 21, bog 2.
Humulus Lupulus, L., 22.
Hydrastis Canadensis, L., 8.
Hydrophyllum appendiculatum, Mx., 22.
Hydrophyllum Canadense, L., 22.
“ Virginica, L., 22.
Hypericum corymbosum, Muhl., 24.
“ perforatum, L., 24.
Hypericum calinianum, 24.
Hyssop, L., 14.
Hyssopus officinalis, L., 14.
Iberis sempervirens, L., 25.
Ilex verticillata, Gray, 24.
Impatiens fulva, Nutt., 23.
Impatiens pallida, Nutt., 23.
Indian cucumberroot, Gronov., 10.
Indian pink, 2.
Indian rice, L., 38, next to pond 3.
Indian turnip, Torr., 17.
Inula Helenium, L., 36.
Inula squarrosa, L., 36.
Ipomœa pandurata, Meyer, 23.
Iris aurea, 20.
“ lucida, 20.
“ achrolenca, 20.
“ pumila, L., 20.
“ setosa, 20.
“ sterofitola, 20.
“ Virginica, L., 20.
“ ? 20.
“ ? 20.
“ ? 20.
Ironwood, L., 37.
Ironweed, Schreb.
Isopyrum biternatum, T. & G., 8.
Jack-in-the-Pulpit, Torr., 17.
Jeffersonia diphylla, Pers., 18.
Jerusalem artichoke, L., 35.
Juglans nigra, southwest, by river.
Juncus 3 sp's, L., 38.
Juniperus communis, L.
“ sabina, var. procumbens, L., 3.
Kalmia glauca, Ait., 21.
Kœleria cristata, Pers., 38.
Labrador Tea, Ait., 21.
Lactuca Canadensis, L., 33.
Lady's slippers, L., 5.
Lamb's quarters, L., 22.
Laportea Canadensis, Gaud., 22.
Lappa officinalis var. major, All., 33.
Larix Americana, Mx., 26.
Lathyrus maritimus, Bigelow, 1.
“ ochroleucus, Hook., 1.
“ palustris, L., 1.
Ledum latifolium, Ait., 21.
Leersia Virginica, Wild., 38.
“ oryzoides, Swartz, 38.
Lemna trisulca, L., pond 1.

Lemna minor, L., pond 1.
“ polyrrhiza, L., pond 1.
“ polyslinga, pond 1.
Leonurus Cardica, L., 14.
Lepidium ruderale, L., 25.
Lespedeza procumbens, Mx., 1.
“ violacea, Pers., 1.
“ hirta, Ell., 1.
“ capitata, Mx., 1.
Leucanthemum vulgare, Lam., 37.
Liatris scariosa, Willd., 37.
Lilies, L., 10.
Lilium Canadense, L., 10.
“ Philadelphicum, L., 10.
“ tigrinum, 10.
Lily of the Valley, L., 10.
Linaria vulgaris, Mill., 29.
Linden, L., 3, 6.
Lindera Benzoin, Meisner, near 18.
Linum usitatissimum, L., 23.
Lithospermum canescens, Lehm., 25.
Live-forever, L., 2.
Liver leaf, Chaix., 8.
Lizard's tail, L., 11.
Lobelia cardinalis, L., 20.
“ spicata, Lam., 20.
“ syphilitica, L., 20.
Lonicera parviflora, Lam., 26.
“ grata, Ait., 26.
“ hirsuta, Eaton, 26.
“ ciliata, Muhl., 26.
“ oblongifolia, Muhl., 26.
Loosestrife, Tourn., 24.
Lophanthus nepetoides, Benth., 14.
Louse-wort, L., 29.
Low Hop-Clover, 1.
Lucerne, L., 1.
Lupin, L., 1.
Lupinus parennis, L., 1.
Lycium vulgare, Duncl., 22.
Lychnis Githago, Lam., 2.
“ vespertina, Sibth., 2.
Lycopodium sp's, L., 13.
Lycopus sinuatus, L., 14.
Lythrum salicaria, L., 28.
Mallow, L., 9.
Malva alcea, L., 9.
“ moschata, L., 9.
“ rotundifolia, L., 9.
Maidenhair fern, L., 13.
Mandrake, L., 18.
Maple, Tourn., 3, 13, 18.
Marrubium, vulgare, L., 14.
Marsh marigold, L., 8.
Martynia proboscides, Glox., 40.
Maruta cotula, D. C., 36.
Matricaria Tanacetum, 36.
May-apple, L., 18.
May-weed, DC., 36.
Meadow Rue, L., 8.
Meadow parsnip, Nutt., 28.
Meadow sweet, L., 3.
Medeola Virginica, L., 10.
Medicago sativa, L., 1.
“ lupulina, L., 1.
Melilotus alba, Lam., 1.
Menispermum Canadense, L., 30.
Mentha Canadensis, L., 14.
“ piperita, L., 14.
“ viridis, L., 14.
Menyanthes trifoliata, L., 11, 24.
Milium effusum, L., 38.
Milkvetch, L., 1.
Milkweed, L., 32.
Mimulus ringens, L., 29.
Mints, L., 14.
Mitella diphylla, L., 7.
Mitre-wort, L., 7.
Monarda fistulosa, L., 14.
Monkey flower, L., 29.
Morus rubra, L., 22.
Mother-wort, L., 14.
Mountain maple, Lam., 3.
Muhlenbergia glomerata, Trin., 38.
“ Mexicana, Trin., 38.
“ sylvatica, Torr., 38.
“ diffusa, Schreb., 38.
Mulberry, L., 22.
Mullein, L., 29.
Musk-plant, Torr., 29.
Musquash-root, L., 28.
Myosotis arvensis, Hoffm., 25.
Myosotis palustris, With., 25.
Myrtle (False), L.
Nabalus albus, Hook., 33.
“ altissimus, Hook., 33.
Nasturtium officinale, R. Br., 25.
“ palustre, DC., 25.
“ Armoracia, Fries., 25.
Naumburgia thyrsiflora, L., 24.
Negundo aceroides, Mœnch., 13.
Nelumbium luteum, Willd., Pond 3.

Nemopanthes Canadensis, DC., 24.
Nepeta Cataria, L., 14.
“ mussina, Henkel, 14.
“ nuda, L., 14.
Nesæa verticillata, H. B. K., 28.
Nettle, Gaud., 22.
New York Fern, 13.
Nightshade, L., 22.
Niellia opulifolia, L., 3.
Nine-Bark, L., 3.
Norway Spruce, Mx., 6, 31, 32.
Nuphar advena, Ait., 15, Pond 2.
Nymphæa tuberosa, Paine, 15, Pond 2.
Nyssa, L., 39.
Oak, L., 6.
Œnothera biennis, L., 28.
Onion, L., 10.
Onoclea sensibilis, L., 13.
“ struthiopteris, 13.
Opuntia Rafinesquii, Engelm., 19.
Orchis spectabilis, L., 5.
“ rotundifolia, 5.
Ornithogalum umbellatum, L., 10.
Orobus, Tourn., 1.
Oryzopsis asperifolia, Mx., 38.
Osmorrhiza brevistylis, DC., 28.
Osmunda cinnamomea, L., 13.
“ Claytoniana, L., 13.
“ regalis, L., 13.
Ostrich Fern, Willd., 13.
Ostrya Virginica, Willd., 4, 6.
Oxalis corniculata, Var. stricta, L., 23.
Ox-eye Daisy, Lam., 37.
Panicum virgatum, L., 38.
“ dichotomum, L., 38.
“ latifolium, L., 38.
“ clandestinum, L., 38.
Papaver Asiaticus, 18.
“ orientale, L., 18.
Parsnip, L., 28.
Pastinaca sativa, L., 28.
Pea, L., 1.
Pedicularis Canadensis, L., 29.
“ lanceolata, Mx., 29.
Peltandra Virginica, Raf., 17.
Pennyroyal, Pers., 14.
Pentstemon digitalis, Nutt., 29.
“ fertus, Var. Cæruleus-purpurens, Nutt., 29.
Pentstemon, procumbens, 29.
“ pubescens, Solander, 29.
Pepperidge, Wang., 39.
Peppermint, L., 14.
Pepper and Salt, Nutt, 28.
Periwinkle, Walt., 32.
Phalaris arundinacea, L., 38.
Phaseolus ? L., 1.
Phegopteris hexagonoptera, Fee., 13.
Phlox divaricata, L., 29.
“ piloso, L., 29.
“ subulata, L., 29.
Phragmites communis, Trin., 38.
Physalis Virgiana, L., 22.
“ pubescens, L., 22.
Phytolacca decandra, L., 40.
Picea excelsa, L., 4, 6, 31.
Pickerel weed, L., 15, Pond 2.
Pig-weed, L., 22.
Pilea pumila, Gray, 22.
Pimpinella integerrima, B. & H., 28.
Pines, L., 4, 6.
Pinks, L., 2.
Pink Yarrow, 23.
Pinus strobus, L.. 4, 6.
“ sylvestris, L., near 3.
Pisum sativum, L., 1.
Pitcher-plant, L., Bog 1.
Plantain, L., 29.
Plantago major, L., 29.
“ lanceolata, L., 29.
Plantanus occidentalis, L., south by river.
Poa annua, L., 38.
“ compressa, L., 38.
“ alpina, L., 38.
“ trivialis, L., 38.
“ sylvestris, Gray, 38.
Podophyllum peltatum, L., 18.
Poison Hemlock, L., 28.
Poison Ivy, L., 16.
Poison Sumac, DC., 16.
Poke, L., 40.
Polygala sanquinea, L., 1.
“ Senega, L., 1.
Polygonatum biflorum, Ell., 10.
“ giganteum, Diet., 10.
Polygonum amphibium, L., 25, Bog 1.
“ Persicaria, L., 25.
“ Hydropiper, L., 25.
“ erectum, Roth., 25.
“ sagittatum, L., 25.
Polymnia Canadensis, L., 36.

Polypodium vulgare, L., 13.
Pontederia cordata, L., 15, Pond 2.
Poppy, L., 18.
Populus balsamiferea, var. candicans, Mx., 3.
Populus monilifera, Ait., near Pond 1.
“ tremuloides, Mx., 6.
Portulaca oleracea, L., 3.
“ grandiflora, L., 3.
Potamogeton, Sp. ? Bog 27.
Potentilla Canadensis, Var. Simplex, T. & G., 3.
Potentilla rupestris, 3.
“ verna, 3.
Prairie Rose, 3.
Prickly Ash, L., 30.
Prickly Comfrey, 25.
Prunus serotina, Ehrhart, 3.
“ Virginiana, L., 3.
“ arbutifolia, Var. melanocarpa, L., 3.
Prunus pumila, L., 3.
Ptelea trifoliata, L., 30.
Pteris aqualina, L., 13.
Puccoon, L., 25.
Pycnanthemum lanceolatum, Pursch., 14.
Pyrola eliptica, Nutt., 21.
Pyrus arbutifolia, Var. melanocarpa, L., 3.
Pyrus Malus, Tourn., 3.
Quercus alba, L., 4, 6.
“ macrocarpa, Mx., 14.
“ Prinos, L., 4.
“ rubra, L., 6.
Rabbitfoot clover, 1.
Ragweed, L., 36.
Ranunculus acris, L., 8.
“ abortivus, L., 8.
“ multifidus, Pursh., 8.
“ fascicularis, Muhl., 8.
“ repens, L., 8.
“ bulbosus, L., 8.
Raspberry, L., 3.
Rattlesnake Fern, 13.
Rattlesnake grass, Trin., 38.
Rattlesnake Plantain, R. Br. 5.
Red Ash, Walt., 28.
Red clover, L., 1.
Red currant, L., 7.
Red maple, L., 3.
Red-root, L., 25.
Red-top, With., 38.
Rhamnus catharticus, L., 23.
“ alnifolius, L'Her., 23.
Rheumatism-root, Pers., 18.
Rhus Toxicodendron, L., 16.
“ venenata, DC., 16.
Ribes Cynosbati, L., 7.
“ rotundifolium, Mx., 7.
“ prostratum, L'Her., 7.
“ floridum, L'Her., 7.
“ rubrum, L., 7.
Rib-grass, L., 38.
Rice-cut grass, Swartz, 38.
Rock Fern, 13.
Roses, L., 3.
Rosa Californica, var. ultra-Montana, 3.
“ Carolina, L., 3.
“ parviflora, 3.
“ setigera, Mx., 3.
Rosin-weed, L., 36.
Rubus Canadensis, L., 3.
“ hispidus, L., 3.
“ occidentalis, L., 3.
“ strigosus, Mx., 3.
“ villosus, Ait., 3.
Rudbeckia laciniata, L., 36.
“ hirta, L., 36.
Rue, L., 30.
Rumex crispus, L., 25.
“ obtusifolius, L., 25.
“ Acetosella, L., 25.
“ verticillatus, L., 25.
Ruta graveolens, L., 30.
Sage, L., 14.
Sagittaria variabilis, Engelm., 17.
Salix alba, var. ? L., 10, 14.
“ discolor, Muhl., 31.
“ livida var. occidentalis, Wahl., 14.
“ lucida, Muhl., 14.
“ fentandra, L., 14.
“ viminalis, L., 14.
Salvia officinalis, L., 14.
“ japonica, L., 14.
Sambucus Canadensis, L., 6.
“ pubens, 6.
Sand Cherry, 3.
Sanguinaria Canadensis, L., 18.
Sanicula Marilandica, L., 28.
Saponaria officinalis, L., 26.
Sarracenia purpurea, L., bog 1.

Sarsaparilla, L., 28, 31.
Sassafras officinale, Nees., 6.
Saururus cernuus, L., 11.
Saxifraga cardifolia, How., 7.
“ peltata, 7.
“ Pennsylvanica, L., 7.
Scirpus validus, Vahl. 38.
“ sp's, 38.
Scotch Pine, Poir., near 3.
Scrophularia nodosa, L., 29.
Scutellaria galericulata, L., 14.
Sedges, L., 38.
Sedum Fabaria, 2.
“ hybridum, L., 2.
“ maximum, Hoffm, 2.
“ maximowrizi, 2.
“ purpurascens, 2.
“ ?
Seneca Snakeroot, L., 1.
Senecio aureus, L., 33.
Senna, L., 1.
Sensitive Fern, L., 13.
Shad-bush, Medic., 6.
Shag-bark hickory, N., south of botanical laboratory.
Sheep sorrel, L., 25.
Shepherdia Canadensis, N., near 19.
Shepherd's Purse, Mœnch., 25.
Shield Fern, L., 13.
Shin-leaf, Nutt., 21.
Silene Pennsylvanica, Mx., 2.
“ viridiflora, L., 2.
Silkweed, L., 32.
Silphium laciniatum, L., 36.
“ perfoliatum, L., 36.
“ terebinthinaceum, L., 36.
Sisymbrium officinale, Scop., 25.
Sisyrinchium Bermudiana, var. anceps, L., 20.
Sium cicutæfolium, Gmelin., 28.
Skoke, Tourn., 40.
Skunk cabbage, Salisb., 17.
Smart-weed, L., 25.
Smilacina bifolia, Ker., 10.
“ racemosa, Desf., 10.
“ stellata, Desf., 10.
Smilax herbacea, L., 31.
“ rotundifolia, L., 31.
Snake-root, L., 1, 8, 33.
Sneezewort, L., 36.
Soapwort, L., 2.
Solanum Dulcamara, L., 22.
“ nigrum, L., 22.
“ tuberosum, L., 22.
Solidago cæsia, L., 34.
“ lanceolata, Ait., 34.
“ latifolia, Muhl., 34.
“ nemoralis, Ait., 34.
“ patula, Muhl., 34.
“ serotina, Willd., 34.
“ arguta, Ait., 34.
“ altissima, L., 34.
“ Canadensis, L., 34.
“ gigantea, Ait., 34.
Solomon's Seal, Ell., 10.
Sorghum nutans, L., 38.
Spanish Bayonet, L., 37.
“ Geranium, 23.
Sparganium eurycarpum, Engelm., 12, pond 1.
Spatter Dock, Smith, pond 2, No. 15.
Spearmint, L., 14.
Speedwell, L., 29.
Spice-bush, Nees., near 18.
Spiderwort, L., 20.
Spikenard, L., 28.
Spiræa Aruncus, L., 3.
“ digitata, W., 3.
“ Filipendula, L., 3.
“ salicifolia, L., 3.
“ ? 3.
“ ? 3.
Sponge, L., pond 2.
Spotted hemlock, 28.
Spring beauty, L., 3.
Spurge, L., 4.
Squirrel's corn, DC., 18.
Squirrel-tail grass, L., 38.
Stachys aspera, Mx., 14.
Staphylea trifolia, L.
Star of Bethlehem, L., 10.
Statice latifolia, Sm., 10.
“ tatarica, L., 18.
Steironema ciliata, L., 24.
“ lanceolatum, var. hybridum, Walt., 24.
Steironema nummularia, L., 24.
Stipa spartea, L., 38.
St. Johns-wort, L., 24.
Strawberry, L., 3.
Strawberry-bush, L., 26.
Strawberry blite, Tourn., 22.

Sweet clover, Lam., 1.
Sweet Flag, L., 17.
Sweet Cicily, Raf., 28.
Symphoricarpus racemosus, Mx., 20.
Symphytum officinale, L., 25.
Synthyris Houghtoniana, Benth., 29.
Tamarack, Mx., 26.
Tanacetum vulgare, L., 33.
Tansy, L., 33.
Taraxicum Dens-leonis, Desf., 33.
Tare, L., 1.
Taxodium distichum, Rich., 26.
Taxus baccata, L., Bog 2.
Teasel, L., 29.
Teucrium Canadensis, L., 14.
Thalictrum purpurascens, L., 8.
Thaspium arreum, Nutt., 28.
" trifoliatum, Nutt., 28.
Thistle, Scop., 35.
Thoroughwort, L., 37.
Thuja occidentalis, L., 6, 10, 13, 14.
Thymus Serpyllum, L., 14.
" vulgaris, L., 14.
Tickseed, L., 37.
Tick-Trefoil, DC., 37.
Tiger Lily, L., 10.
Tilia Americana, L., 3.
Toad Flax, Mill., 29.
Touch-me-not, Nutt., 23.
Tradescantia pilosa, Lehm., 20.
" Virginica, L., 20.
Trailing Arbutus, L., 21.
Trientalis Americana, Ph., 24.
Trifolium arvense, L., 1.
" agrarium, L., 1.
" pratense, L., 1.
" procumbens, L., 1.
" repens, L., 1.
Trillium grandiflorum, Salisb., 10.
Triosteum perfoliatum, L., 26.
Triticum caninum, L., 38.
Trollius Asiaticus, Salisb., 8.
Tsuga Canadensis, Endl., 4, 6, 31.
Tulip, Tourn., 10.
Tulipa Gesneriana, Tourn., 10.
Turtle-head, L., 29.
Twin-leaf, Bart., 18.
Typha angustifolia, L., 12, Pond 1.
" latifolia, L., 12, Pond 1.
Ulmus Americana, L., 21.
Urtica dioica, L., 21.
Utricularia vulgaris, L., 27.
Uvularia grandiflora, Smith, 10.
Vaccinium Canadense, Kalm., 21.
" corymbosum, L., 21.
" macrocarpon, Ait., 21.
Valeriana officinalis, N., 29.
Vallisneria spiralis, L., Pond 2.
Velvet grass, L., 38.
Verbascum Thapsus, L., 29.
Verbena hastata, L., 2.
" incisa, L., 2.
" urticæfolia, L., 2.
Vernonia fasciculata, Mx., 2.
" Novaboracense, Willd., 37.
Veronica Chamædrys, L., 29.
" officinalis, L., 29.
" scutellata, L., 29.
" Virginica, L., 29.
" ? 29.
Vervain, L., 29.
Vetch, L., 1.
Viburnum acerifolium, L., 26.
" Opulus, L., 26.
" pubescens, Ph., 26.
" Lentago, L., 26.
" nudum, L., 26.
" dentatum, L., 26.
Vicia Americana, Muhl., 1.
" Caroliniana, Walt., 1.
Vinca minor, L., 32.
Viola lanceolata, L., 21.
" rotundifolia, Mx., 21.
" blanda, Willd., 21.
" Canadensis, L., 21.
" canina, L. Var. sylvestris, Regel., 21.
Viola cucullata, Ait., 21.
" pedata, L., 21.
" primulæfolia, L., 21.
" pubescens, Ait., 21.
" " var eriocarpa, Ait., 21.
" rostrata, L., 21.
" sagittata, Ait., 21.
" striata, Ait., 21.
Violets, L., 21.
Virginia Creeper, Lam., 21.
Virgin's Bower, L., 8.
Vitis æstivalis, L., 21.
" riparia, Mx., 21.
" bipinata, T. & G., 21.
" quinquefolia, Lam. 21.

Waahoo, Jacq., 26.
Waldsteinia, Willd., 3.
Water Chinquepin, Willd., Pond 3.
Water Cress, R. Br., 25.
Water Carpet, Schw., 7.
Water Dock, 25.
Water Horehound, L., 14.
Water Leaf, Tourn., 22.
Water Lily, L., 15, Pond 2.
Water Parsnip, L., 28.
Water Plantain, L., 17.
White Ash, L., 3.
White Bent Grass, L., 38.
White Birch, Spach., 9.
White Clover, L., 1.
White Cedar, L., 6, 10, 13.
White Lettuce, Hook., 33.
White Grass, Willd., 38.
White Melilote, Lam., 1.
White Oak, L., 6.
Whortleberry, H. B. K., 21.
Wild Balsam, T. & G., 23.
Wild Bean, Bœrhaave, 1.
Wild Columbine, L., 8.
Wild Foxtail, Mx., 38.
Wild Gooseberry, Tourn., 7.
Wild Indigo, R. Br., 1.
Wild Lettuce, L., 33.
Wild Onion, Roth., 10.
Wild Potato, Tourn., 22.
Wild Rice, Pond 3, 38.
Wild Senna, L., 1.
Wild Sunflower, L., 35.
Wild Turnip, Torr., 17.
Wild Yam, L., 40.
Willows, Tourn., 10, 13, 14.
Willow herb, L., 28.
Wintergreen, L., 21.
Wisconsin Weeping Willow, near Pond 1.
Witch Hazel, L., 6, near Pond 3.
Woodbine, L., 26.
Woodwardia augustifolia, Smith, 15.
Wormwood, L., 33.
Xanthium strumarium, L., 36.
Yarrow, L., 33.
Yellow Lily, Smith, 15, Pond 2.
Yellow Pond Lily, Smith, 15, Pond 2.
Yellow Water Crowfoot, Pursh., Bog 1.
Yucca filamentosa, L., 10.
Zanthorhiza apiifolia, L'Her., 8.
Zanthoxylum Americanum, Mill., 30.

REPORT OF THE DEPARTMENT OF MATHEMATICS AND CIVIL ENGINEERING.

President Abbot:

Dear Sir,—I have the pleasure of submitting to you the following report of the department of Mathematics and Engineering for the school years of 1880–1 and 1881–2.

This department, like several other departments of the College, includes work done both in the class room and in actual construction. The work done in the class room is given in detail farther on in this report, and I need only say here that it covers the wide range of subjects embraced by algebra, geometry, trigonometry, surveying, drawing, mechanics or natural philosophy, astronomy, and civil engineering, nearly any one of which would form ample work for one man. The work in construction covers the repairs in brick and iron, and is referred to in detail in the latter portion of this report.

CLASS INSTRUCTION.

From February, 1881, Mr. L. G. Carpenter has acted as assistant in mathematics, and has taught the studies of algebra, geometry, and free hand drawing. As algebra and geometry each extends over two terms, and as the classes in these studies are so large that they have to be divided for instruction, his work averages three and one-third classes each day. A special report of his work is appended to this report.

During the last two years I have taught the studies of trigonometry, surveying, mechanics, astronomy, and civil engineering. During the last year, 1881-2, I also taught mechanical drawing. My class work has averaged two and two-thirds classes per day. The courses of instruction followed in these studies need not be given in detail here, as the topics pursued are essentially those laid down in the catalogue. In civil engineering I have undertaken to give instruction in those constructions and mechanical operations merely, which are of interest principally to the practical farmer. The course has been confined to "road construction and improvement," "construction of buildings," foundations, mortars and cements, architecture, simple mechanical operations, and farm machinery.

APPARATUS FOR CLASS INSTRUCTION.

Our apparatus for class room instruction is quite complete for the subject of surveying, including one theodolite, one transit, two compasses, two wye levels, and a number of chains. We need only for this study a solar compass and a plane table.

In astronomy we have one 5½ inch telescope, made by Alvin Clark & Sons, mounted equatorially and provided with clock work and declination circle reading to 30 seconds of arc and hour circle reading to single seconds of time. We have a sextant made by Fauth & Co. of Washington, D. C., and a 30-inch astronomical globe. Considering the limited time this study is taught, we have nearly all the apparatus needed.

In drawing we have a few wooden models. Additional models are desirable.

In pure mathematics we are well supplied with blackboards, plane and spherical, and have no immediate need of apparatus.

In civil engineering we have the models of the model museum, about 1,000 in number, and in the main well suited for class instruction in this study.

In mechanics or natural philosophy, where much apparatus is needed, we have very little, and that of very inferior quality. The instruction would doubtless be much more valuable to the students could the experiments referred to in the text book be actually performed.

The following shows in a tabulated form such information as may probably be desired regarding the classes under my immediate instruction for the school years of 1880-1 and 1881-2:

CLASS REPORT TABULATED.

Time.	Study.	Class.	No. Enrolled.	Number Failing.	Number Leaving College.	Number Passed.	Weeks of Study.
1880.							
Autumn	Geometry A	Sophomores	26	4	2	20	11
“	“ *B	Sophomores					
“	Mechanics	Juniors	31	0	0	31	5½
“	Algebra A	Freshmen	38	1	0	37	11
“	Algebra B	Freshmen	37	5	2	30	11
1881.							
Spring	Trigonometry A	Sophomores	21	0	2	19	26
“	“ B	Sophomores	21	3	3	15	6
“	Surveying A	Sophomores	20	0	1	19	6
“	“ B	Sophomores	20	0	1	20	6
Summer	Civil Engineering	Seniors	37	0	0	37	12
“	Astronomy	Seniors	31	0	0	31	6
“	Mechanics	Sophomores	40	2	2	35	12
Autumn	Civil Engineering	Seniors	29	0	4	25	11
“	Mechanics	Juniors	33	0	3	30	5½
1882.							
Spring	Trigometry A	Sophomores	20	1	0	19	6
“	“ B	Sophomores	19	1	1	17	6
“	Surveying A	Sophomores	20	0	0	20	6
“	“ B	Sophomores	19	0	0	19	6
“	Drawing A	Freshmen	27	0	2	25	6
“	“ B	Freshmen	28	0	1	27	6
Summer	Astronomy	Seniors	30	0	0	30	6
“	Mechanics	Sophomores	39	3	2	34	12

* Taught by Professor Cook and Mr. W. W. Remington.

MECHANICAL OPERATIONS.

New Works and Repairs.

From the difficulty of getting good or honest work from contractors or ordinary workmen, I was led to commence the system of doing our own repairing of our steam works. Finding that this plan not only gave better results, but effected a very great saving to the College, we have extended the system to new works, as yet, however, on a small scale. The objections to this method are that it requires so much of my time that class work is likely to be neglected, and that work done with assistance of students who labor only about three hours each day is likely to be extended over a long time. The advantages are better work and low cost.

During 1881, assisted by students, H. Bamber and C. Phelps, I made quite extensive changes in the steam-heating apparatus in Wells Hall, adding much to its efficiency, and constructed a sewer from Williams Hall to the river, a distance of about 600 feet. Also,

Built a pump-well near the river, eight feet in diameter and eight feet deep, having a depth about four feet below the bottom of the river; connected the well bottom with the river bottom by an eight-inch sewer pipe; laid from the pump well to the boiler-house, a distance of 500 feet, a four-inch suction pipe of wrought iron covered with asphaltum to prevent rusting; laid 800 feet of 2½-inch discharge pipe from boiler-house to Williams Hall and the new library and museum.

During the school year 1881–2, I had, as assistants, F. E. Delano, J. M.

Smith, and A. Chappell, of the Senior class. We put in steam-heating apparatus in analytical room of chemical laboratory; put in gas fittings and fixtures in new part of chemical laboratory, and in room at north end; also put in water pipes and fittings for wash basins in new library and museum building. Much work was also done on the boiler-house that otherwise would have been done by contractor of steam works as extras. During the spring and summer terms of 1882 we employed a skilled workman, J. W. Swartz, as engineer. Although his work at the boiler-house confined him rather closely most of the time, still he was enabled to assist on several jobs requiring especial skill. We put into the President's house a job of plumbing, including bath and fixtures, closet, wash basin, water boiler, pump, and cistern, in a manner that has given satisfaction. In addition to this, small repairs of various kinds were constantly met with and made right, thus saving to the College what would be in the end a great expense.

How far it will be profitable to extend this system of doing our own mechanical work will be, of course, for the Board to determine. My own opinion is that it should at least be made to embrace all future constructions of steam or water works.

Surveying.

During the time covered by this report only such surveying has been done as was rendered necessary by the construction of drains. Drains have been laid out and stakes marked for construction in fields No. 12 and 13. Three to four weeks were partially occupied with surveying duties.

Equipment for Repairs in Brick and Iron.

We have in this department a set of tools for blacksmith work, a few tools for stone masonry and carpentry, three set of wrenches for steam and gas fitting, one complete set of pipe taps and dies, one small hand lathe, a set of lathe tools, and a set of plumber's tools. This portion of the department is very well equipped. We should, however, find it profitable to own a small lathe and planer, each worked by steam power. The cost of both, with engine, would not exceed $500.

STEAM WORKS.

In the spring of 1881 the Board of Agriculture decided to erect boilers for steam heating of the various buildings in one locality. Jarvis, Barnes & Co. of Lansing being the lowest bidders were awarded the contract of manufacturing and setting four tubular boilers, each four feet by twelve feet, provided with necessary attachments and a sheet-iron smoke stack, thirty inches diameter, seventy feet in height, provided with brick base fifteen feet in height. This contract was completed for the sum of $3,000.

The Lansing Iron Works paid for the two boilers in Williams Hall, each being 10 feet by 36 inches, and having been in use eleven years, and for one boiler in Wells Hall, 8 feet by 48 inches, having been used three years, the sum of $750. This made the actual outlay for new boilers $2,250.

Andrew Harvey & Son of Detroit were awarded the contract for steam heating works in the Museum and Library building, and also the laying of underground pipes from the boiler house to each of the buildings heated, amounting in all to 1,400 feet, for about $5,000. This contract was performed in a satisfactory manner.

There being no funds for the erection of a boiler house, a building 36 by 30 feet, with a board roof and a lean-to room for the engineer, was erected at a cost of $145. This cheap building is troublesome; it leaks in rainy weather, and during cold, freezing weather it has been difficult to prevent damage to our pumps and water pipes. Considering the value of the machinery, it will be economy to construct, as soon as the funds can be provided, a building that will protect the steam works from rain and frost.

Our furnaces and chimney were constructed with especial view to burning wood, for which they are well adapted. During the past year, for some reason, wood was not provided, and coal had to be used in its stead. For such fuel our draft proved in a measure inadequate. If we are to continue to use coal, the cost of a good-sized brick chimney will be more than saved in two years over our present small smoke stack. The present outlook is not favorable for securing wood, and for that reason I would urge the construction of a brick chimney as soon as funds can be secured for its erection.

The buildings at present heated by steam are—

Wells Hall, containing	201,600	cubic feet.
Williams Hall, containing	147,420	cubic feet.
Library and Museum, containing	105,600	cubic feet.
Chemical Laboratory, containing	62,520	cubic feet.
Total	517,140	

For heating these buildings we have ample boiler capacity, yet in extreme cold weather it is all necessary. We have in our boilers 2,208 square feet of heating surface, or one to each 234 cubic feet of space to be heated. The College Hall, containing 165,000 cubic feet of space, should be heated by steam. To do so will require one additional boiler the same size of each of the four we now have.

FIRE PROTECTION.

I desire to call attention to the fact that we are without efficient means of fire protection. We have a Worthington duplex pump, with a capacity of three barrels per minute, and we have from this pump a two and one-half inch water pipe to Williams Hall and to the Library and Museum. We have about 100 feet of small hose, but none of any especial value in case of a fire. Up to the fall of 1881 we had no pump except a small one for feeding the boilers. We were enabled to purchase the present pump with the savings affected by the construction of certain works by myself, assisted by students. We should have pipes leading from this pump to various portions of the grounds, and especially to the various barns. The barns being nearly in one group, surrounded and filled with inflammable matter, and open without restriction to the public, represent what would probably be considered a maximum fire risk. Under the present conditions, were fire to get started in any one, the group including cattle barn, horse barn, sheep barn, and tool house, with contents, would probably be entirely destroyed.

The cost of a complete system of water works, including a large steam pump, large tank in tower of Williams Hall, and pipe of suitable size laid near each building, hydrants and suitable hose and carts, would be covered by $6,000, or about two per cent of the property protected.

The barns and large buildings, including nearly all of the College property especially liable to be destroyed by fire, could be provided with water-works for $4,000.

MECHANICAL WORK-SHOP.

There are certain mechanical processes more or less intimately connected with agricultural operations. A farmer, isolated as he is from villages or cities, often finds that the knowledge of some elementary mechanical process, such as welding a broken rod or reconstructing a broken tongue to his wagon, would save a long and costly journey at a season of a year when time is worth more than money. He might, and probably would, find a knowledge of "how to do" certain things useful in a broader sense than mere repairing. His ability, if time permitted, would allow him actually to construct many of the machines used in agriculture; but whether he actually do construct them or not, the mechanical training will make him more independent and give him an ability to recognize good mechanical work that otherwise he could never have possessed.

An education of the present day must, to be valuable, be a practical one. A practical education must give a man some knowledge of the processes he must have to employ after leaving college. The farmer of to-day does most of his work with machines and amongst machines, and the education of the farmer, if it fits him for the every-day duties of farm life, should give him some practical knowledge of the machines he in after life is to work. This can be done successfully only by a short course in a mechanical work-shop. Such a course will make him familiar with the actual processes of construction and with the principles of mechanical movements. It matters little what may be the especial machine worked at, nor is it necessary that he stay in the shop long enough to become a skilled mechanic.

Most of the Agricultural Colleges of other States found it necessary to introduce these mechanical workshops from the very first, and so far as I can learn the practical results have been uniformly satisfactory. Hon. H. G. Reynolds and myself were appointed by the State Board of Agriculture a committee to visit the mechanical workshops of Agricultural Colleges of neighboring States. Our time permitted us to visit only the shops in connection with the Ohio State University at Columbus and Purdue University at La Fayette, Indiana. A detailed report of this visit will doubtless be presented to the Board by Mr. Reynolds, and it will suffice in this place to say that in both institutions the results were highly satisfactory.

The first cost of this mechanical workshop must necessarily be large, but it will not be without its financial benefits.

The work done by students at the College is supposed to be of two kinds; that which is purely educational to the student, and that which is solely or principally beneficial to the College. The educational labor is solely or principally of benefit to the student, and for this he should no more receive remuneration than for attending classes. For various reasons it has not been possible to separate these two classes as unpaid and paid, but labor in both has been paid for, with few exceptions, uniformly. This has made a large annual outlay for which there has been no corresponding benefit. The workships will only furnish educational or unpaid labor, and it is estimated that if the shops are built sufficiently large to accommodate 80 or 90 students at one time, the saving in this respect will be $1,500 per year, or fully one-eighth the cost of the shops and equipment.

The whole of which is respectfully submitted.

R. C. CARPENTER,
Professor Mathematics and Engineering.

To the President:

Beginning with February, 1881, my class work has been as follows:

During the spring and summer terms of 1881, I had charge of the Freshman class in Geometry, during which time the class, reciting in two divisions, completed Olney's Geometry. Eighty began the study in the spring, and of 68 present at the examination, 12 having left college in the meantime, all passed but two. Of the 66 enrolled in the summer term, 10 left college, 5 failed, and the remaining 51 passed.

In the autumn term four classes in Algebra were in my charge. The Freshman class numbering 52, recited in two divisions, and passed over about 170 pages of Wells's University Algebra. Of these, 18 left before the close of the term to begin schools, and at the final examination 4 failed while 30 passed. In the Sophomore class Olney's University Algebra was used as the text-book. The more advanced division completed the book with a few omissions. The number enrolled in the two divisions was fifty-six, 22 of whom left college to begin schools before examination, 5 failed and 29 passed.

Olney's Geometry was completed by the Freshman class, reciting in two divisions, during the spring and summer terms of 1882. In the spring term 48 began the study, 3 left college during the term, 3 failed, and 42 passed. In the summer term 44 began the study, 2 left college, 2 failed, and 40 passed. During the spring term the class in Free-hand Drawing, numbering 51, was also in my charge. One left college before the study was completed—the remaining 50 passed. Each of the two divisions into which the class was divided met on alternate days throughout the term. Drawing was pursued mostly from models, though flat copies were used to some extent. During the time the study is pursued, the class much needs a room where the models and tables may remain undisturbed for work throughout the day. As it was, all the models and the temporary tables had to be hastily stowed away before the beginning of another recitation.

Respectfully submitted,

L. G. CARPENTER,
Assistant in Mathematics.

REPORT OF THE PROFESSOR OF ENGLISH LITERATURE.

To the President of the College:

During the two years for which the following report is made, it has been my duty, a part of the time, to give instruction in classes not belonging properly to my department; and some of the work in my department has been done by other officers. By recent changes in the course of study, French giving place in part to additional English studies, and by the creation of a new department of instruction, the department of English Language and Literature becomes more clearly defined. By the addition of an officer for the added department, which does not as yet demand a professor's full time, I have been greatly aided in the work in English. The distribution of studies between Prof. Harrower and myself will be seen in the following report:

The course in English, as arranged at present, embraces five full terms' work: First term, Freshman year, elementary rhetoric; third term, Freshman year, rhetorical praxis; second term, Sophomore year, studies in English masterpieces; second term, Junior year, advance rhetoric; conviction and persuasion; and third term, Junior year, English literature. All the classes meet weekly for rhetorical exercises according to the subjoined scheme:

FRESHMAN.

First Term.—Essays once a fortnight in Rhetoric class; two declamations.

Second Term.—One exercise a week reading and studying some English classic.

Third Term.—Essays in Rhetoric classes; declamation every three weeks.

SOPHOMORE.

First Term.—Declamations and essays, three exercises.

Second Term.—Essays in class in Higher English; two declamations.

Third Term.—Two original declamations delivered before the class.

JUNIOR.

First Term.—Two essays on assigned subjects; public orations.

Second Term.—Three essays in Rhetoric class; public orations.

Third Term.—Two critical essays in English Literature; public orations.

SENIOR.

First Term.—Two essays on assigned subjects, or debates; public orations.

Second Term.—Two essays on assigned subjects; public orations.

Third Term.—Two essays; public orations.

PUBLIC EXERCISES.

Upon each alternate Wednesday, members of the Junior and Senior classes deliver orations in presence of all the students. Two orations are to be thus presented by each student during his Junior year, and two during his Senior year.

During the autumn term of 1880 I had charge of the Sophomore class in

French. They had already gone over the forms of words, and the term was spent in the study of syntax, with drill in writing and speaking. From the beginning every new word was to be so thoroughly learned, that whenever seen or heard it should suggest, not its English equivalent, but the object, act, quality, or relation for which it stood. The vocabularies for the exercises in the textbook were used in daily conversations in the class; and it was evident that this oral drill inspired enthusiasm, made written work less irksome, and contributed greatly to the progress of the class. Of the fifty-two members of the class, six left before the end of the term, and one failed on examination. During this term the Freshmen were committed to Mr. W. W. Remington, in both Rhetoric and Rhetoricals. The class numbers seventy, and was taught in two divisions. A number of essays was required as a part of the work in Rhetoric; and each student declaimed three times before the class, on Saturday mornings, in the chapel.

I gave instruction to fifty-two Sophomores, thirty-three Juniors, and thirty-three Seniors in Rhetoricals during this term, each class meeting once a week, in two divisions. The Sophomores declaimed and read essays alternate weeks, each student having four exercises. The Juniors and Seniors read essays on assigned subjects every week. A part of these essays were subjected to my criticism before being presented to the class, and a part were criticised when read, in presence of the class, and the manuscript was corrected by me afterwards. Each student presented two exercises.

During the spring term of 1881 I carried forward the Sophomores in French. Sauveur's "*Causeries avec Mes Elèves*" was used as a reading book. Many of LaFontaine's fables were committed to memory and recited. These, with the reading exercises, were used as a basis for conversation, which formed a large part of the class drill. The class had fifty members and was taught in two divisions. I also had thirty-two Juniors in one division in A. S. Hill's Rhetoric. Besides doing the prescribed textbook work each student prepared three or more essays, applying the principles of argumentative composition.

The general rhetorical exercises were widely distributed this term. Dr. Beal took one division of Freshmen, and Mr. Holdsworth the other. Mr. L. G. Carpenter had the Sophomores, and Prof. Harrower the Seniors.

During the summer term of 1881 I gave instruction to thirty-two Juniors in English Literature. Shaw's text-book, embracing a concise history of literature in England from its beginning to authors still living, biographical notices of leading authors, and critical remarks upon their works, was carefully gone over; and this study was supplemented by a critical examination of selections found in "Chamber's Cyclopedia of English Literature." In connection with daily recitations, each student prepared and read before the class three carefully written critical essays. I also had charge of the Senior Rhetoricals, which were the same as last term; Prof. Harrower taking the Freshmen and Sophomores.

In the autumn of 1881, I, for the first time, took the Freshmen in Rhetoric. The class, together with special students, made two-divisions of thirty-one and thirty-six respectively. The course of eleven weeks embraced in D. J. Hill's Rhetoric the subjects of invention, style, punctuation, and the different forms of composition, with frequent exercises in analysis of subjects and essay writing. Before being read in class all essays were submitted to me for correction, criticism, and suggestion as to accuracy, neatness, and method in expression.

The class met every Saturday morning in the chapel for declamations, besides short exercises for drill in vocal culture, expression, position, and gesture. Each student presented two well-studied declamations. The Seniors, at my suggestion, continued the study of English Literature, presenting in class Wednesday mornings essays on masterpieces previously assigned for critical study and review. The Sophomores and Juniors had weekly rhetorical exercises this term with Prof. Harrower.

In addition to the regular work with thirty Juniors in A. S. Hill's Rhetoric, and this work did not differ materially from the corresponding work of the previous year, I had, in the spring of 1882, the Sophomores in Higher English. After the first month the class, numbering forty-one, was divided. Prof. Harrower taking one division. Swinton's "Forty Masterpieces of English Literature" was used as a text-book. Class-room drill comprised cultivating a proper expression when reading aloud; mastery of the thought in the selection, considering, first, general meaning, then meaning of details and individual words, allusions to antiquity, tradition, geography, and history; grammatical constructions and rhetorical excellencies and defects, and classification of the production. The work was varied by familiar lectures on the authors read, and supplemented by critical essays embodying the results of the study. Choice selections were also committed to memory and declaimed before the class. I also had charge of the Seniors' weekly rhetorical exercises, which were like those of the last term, except that American authors were studied instead of English authors. Prof. Harrower had charge of the rhetorical exercises of Freshmen and Juniors. The English Literature work with the Juniors during the summer of 1882 was practically the same as in 1881. The class had thirty members, none of whom dropped out or failed on examination. This term I met twenty-eight Seniors weekly for essays on practical subjects. Each student presented two essays; and many of them were excellent discussions of matters connected with the practical workings of the various industrial departments.

In addition to the work devoted to rhetorical exercises already mentioned, I have had charge of all public orations. Each Senior and each Junior delivers, during the year, in chapel, two public orations. This makes about one hundred and twenty-five exercises every year. For each exercise, the student usually requires aid in selecting a subject, in analyzing it, and in collecting facts, arguments, and illustrations. Criticism of the completed orations is accompanied with personal explanation of changes, suggestions as to correctness of thought and accuracy of statement. I have regularly given about five hours a week to this work and to rehearsals, preparatory to final delivery in public. During the summer terms, while the Seniors have been preparing for graduation and all the classes for class-day exercises, this kind of work has sometimes become very wearing; but since the regular work of my department has been shared with Prof. Harrower I can do it quite comfortably.

A voluntary class of Juniors has met with me regularly on Thursday evenings during the entire year, for reading Shakespeare's plays. In 1881 we read "As You Like It," "The Tempest," and "Hamlet." In 1882 we read "Macbeth," "Merchant of Venice," and "Hamlet." In 1881, I gave two of the regular Wednesday afternoon lectures: one on Longfellow and one on Lowell. In 1882 I gave one on Bryant. Of the winter Institute work I have done my part; lecturing at Bangor and Battle Creek in 1881, and in 1882 taking charge of the organization of the Greenville Institute, and lecturing there, at Berlin, and at Cassopolis. Improvements in my department of instruction during the two years have been: More clearly defining its limits; adding to the course of study; providing for additional instruction; making the essay work of rhetorical exercises a part of some regular study wherever it is practicable; and giving credit for rhetorical work at the close of every term, the same as other work.

THE COLLEGE LIBRARY.

Two rooms are assigned to the library in the Library and Museum Building, just completed; the book-room, 40x50 feet, with 16-feet ceiling, and the reading-room 17x31 feet, with 14-feet ceiling. The book-room occupies the first floor of the back part of the building. It is at the end of the main entrance. Open cases 8 feet high and 13 feet long, built at right angles to the north and south walls, form alcoves 10x13 feet, and afford shelving for about 10,000 volumes. These cases will be extended to the ceiling when needed, and galleries made about them, thus doubling the shelving capacity of the library. The alcoves are furnished with neat reading tables and chairs, and are each lighted by a high, broad window. A projection in the rear of the building forms a large alcove, the walls of which are shelved to the ceiling. The alcove at the left of the entrance, which is a little larger than the others, and contains a grate, is to be finished for Librarian's office. The middle of the room, 14x50 feet, contains double desks. The Librarian's counter is near the front entrance at the right, and commands a view of both book-room and reading-room. The latter is in front and to the right of the general room, and is entered from the front hall, or through a passage, 11 feet wide, from the large room. It is lighted bv large windows on the east and south. It is provided with one large reading table and one large double desk, and comfortable seats. The entire west wall is given to cases of pigeonholes for current periodicals. A few modest pictures hang on the walls, and above the mantel-piece is an elegant life-size oil portrait of the President of the State Board of Agriculture. Chandeliers and bracket lamps afford suitable light in the evening.

The following report of the condition, care and oversight of the Library covers two years and one month, from Sept. 1, 1880, to Oct. 1, 1882: The Library contains, exclusive of about 400 volumes of duplicate reports and public documents, 6,135 bound volumes, valued at a little more than $15,000, and 800 pamphlets and unbound volumes worth, perhaps, $100 (exclusive of catalogues of schools, museums, publications, etc.).

During the period covered by this report there have been added, by purchase, at a cost of about $1,950, 964 bound volumes; by binding, at a cost, including subscription, of $550, 275 volumes; by donations, valued at $234, 234 volumes, making a total increase of 1,472 bound volumes, worth $2.734. In addition to this there are now on hand, or nearing completion, nearly 160 volumes of periodicals to be bound, worth about $200.

The expenditures of the Library have been, in exact figures, exclusive of new furniture for the new library:

Books	$1,948 39
Periodicals	467 21
Freight and express	50 99
Printing and binding	232 69
Stationary and postage	56 51
Labor	187 51

Back numbers of periodicals	$9 45
Hymn books to be sold	21 24

The receipts have been:

Special appropriation of the Legislature	$3,000 00
Sales—Hymn books	9 20
Chemistry Hand Book	66 00
Old papers	10 21
Special examinations	101 00
Herd Book	3 00

For other expenditures, balances, and amounts on hand I refer, by permission, to the financial report of the Secretary of the College.

The Library has been open, as heretofore, from 4 to 6 p. m. on regular school days; from 10 a. m. to 12 m. on Saturdays and Sundays, and from 5 to 6 p. m. on Saturdays. During the school vacation the Library has been open two evenings a week, for the use of the few students who remained at College. The regular daily routine work has been done by student labor, usually by a member of the Senior class. This work has occupied 1,730 hours at 8 cents, or $138.50. It has included care of periodicals, cutting, stitching, arranging in binders, on racks or on the tables, and filing away at the end of each month; care of books, catloguing, labeling, putting on shelves, and entering in books provided a full description of each book as new ones are added, oversight of drawing, giving information to those drawing, keeping account with those using the Library, classifying and recording donations, and the general care of the room; sweeping, dusting, warming, and lighting, and keeping open regularly at the stated time. Student labor has also been employed to do some work in the library not in regular routine; to aid in disposing of new books when coming in large numbers; to complete indexes, arranging files of papers for binding, putting pamphlets in cases and making tables of contents, cleaning library, and carrying books from the old building to the new. This work has occupied 562½ hours and has cost $45.

Preparatory to moving from the old rooms there was a general overhauling of the contents of the Library. Many great files of newspapers which had been accumulating for years, but were not considered worth binding, were disposed of. A few of the most valuable papers—the *Lansing Republican*, *Detroit Daily Post and Tribune*, including the *Advertiser* and *Tribune*, and *Detroit Daily Tribune*, before consolidation with the *Detroit Post*, and the *Michigan Farmer*, complete files of which had been kept—were by faculty vote sent to the bindery. Duplicate Reports were disposed of to the different officers who needed them to complete their sets, or were used in exchange with other colleges to secure volumes needed to complete our sets of Agricultural Reports.

On the completion of the new Library and Museum building, about the close of the spring term, 1882, the library was transferred from the old building to the new. The transfer was made by students, and was completed in three days. The size of sections in the old building and in the new, were so nearly alike that, for the most part, it was possible to transfer and arrange shelf for shelf, thus rendering it unnecessary at present to change the labels or the card catalogue. The new quarters are a great improvement in many ways; the rooms are light and clean; the periodicals are away from the books; the shelves are low enough so that any one may easily reach any book; the ventilation and heating are excellent, and the location is quiet. I have not taken pains to ascertain the number who daily use the Library, but the number of students who spend some time between work hours and supper time in the Library is large.

I am exceedingly gratified at the prospect of a permanent Librarian. This will relieve me from a charge which, distracting in itself, makes other work, consisting of almost infinite detail, doubly distracting, and it will enable me to make the work of my department of instruction of much more value, especially the rhetorical exercises. But the advantages to myself and the English Department are of minor importance. The Library needs the constant care of a competent person who can give it all his time. It will be a great advantage to all using the library to have it open at least a part of the forenoon, as well as the afternoon. The books ought to be classified more systematically and a new and complete catalogue made, both of title and authors. Subject indexes should be made for all books of reference, and as many more as possible. All the periodicals should have their contents indexed as fast as they are received. Subscription lists, books coming in parts, bindery matters, new publications, and opportunities for bargains in books should be looked after more carefully than is possible by one whose time and energy is needed for other duties. Moreover, if the Library can be kept open more hours a day fewer books need be drawn, and thus more persons can use the same books, and there will be less danger of temporary or permanent loss or damage.

I add classified lists of the periodicals received on subscription and by donation, and a list of donations to the College Library.

All of which is most respectfully submitted.

E. J. MacEWAN,
Professor of English Language and Literature, and Librarian.

The following is a list of periodicals subscribed for and bound when volumes are complete:

FOREIGN PERIODICALS.

Agricultural Gazette.
Annales de Chémie et de Physique.
Blackwood's Magazine.
British Quarterly.
Contemporary Review. (Reprint.)
Chemical News.
Canadian Entomologist.
Chambers's Journal.
Edinburgh Review. (Reprint.)
Engineering.
Fortnightly Review. (Reprint.)
Gardener's Monthly.
Garden.
Gardener's Chronicle.
Journal of the Chemical Society.
Journal of Science.
Knowledge.
London Quarterly Review. (Reprint.)
London Times, weekly edition.
London Veterinarian.
London Journal of Anatomy and Physiology.
Nineteenth Century. (Reprint.)
Nature.
North British Agriculturist.
Popular Science Review.
Spectator.
Westminster Review. (Reprint.)

AMERICAN PERIODICALS.

American Architect and Building News.
American Agriculturist.
American Poultry Journal.
American Bee Journal.
American Naturalist.
American Monthly Microscopical Journal.
American Journal of Microscopy.

American Banker's Magazine.
American Journal of Science.
American Bookseller.
Atlantic Monthly.
American Chemical Journal.
Breeders' Gazette.
Country Gentleman.
Critic.
Century.
Detroit Daily Post and Tribune.
Dial.
Engineering News.
Education.
Farmer's Review.
Harper's Magazine.
International Review.
Independent.
Journal of Franklin Institute.
Journal of Mathematics.
Journal of American Agricultural Association.
Journal of Forestry.
Literary World.
Michigan Farmer.
Microscope.
Magazine of American History.
Mathematical Magazine.
Monograph.
Manufacturer and Builder.
Monthly Reference List.
Nation.
National Live-stock Journal.
Northwestern Farmer.
North American Review.
New York Semi-Weekly Tribune.
Popular Science Monthly.
Papilio.
Prairie Farmer.
Psyche.
Plumber and Sanitary Engineer.
Rural New Yorker.
Scientific American.
Scientific American Supplement.
Science Observer.
Van Nostrand's Engineering Magazine.
Wallace's Monthly Magazine.

The following from the subscription list are not bound, but kept on file in the reading-room:

Chicago Daily Tribune.
Detroit Daily Free Press.
Indiana Farmer.
Iowa State Register.
Memphis Appeal.
Mirror and Farmer.

The following periodicals sent as donations from the publishers or Government offices are bound as volumes are completed:

American Bee-keepers' Magazine.
American Missionary Magazine.
Boston Journal of Chemistry.
Bulletin of the Essex Institute.
Circulars of Information, U. S. Educational Bureau.
Gleanings in Bee Culture.
Grange Visitor.
Lansing Tri-Weekly Republican.
Official Gazette of U. S. Patent Office.
Practical Farmer.
Unitarian Review.
Vick's Monthly Magazine.

President Abbot has regularly left in the reading-room current numbers of

Princeton Review.
Christian Union.

The following are given by publishers, and are kept on file in the reading-room:

American Rural Home.
Adrian Weekly Times.
Appleton's Literary Bulletin.
Benton Harbor Times and Palladium.
Benzie County Journal.
Battle Creek Journal.
Cincinnati Grange Bulletin.
Charlotte Republican.
Christian Register.
Coldwater Republican, (semi-weekly).
City and Country.
Deaf Mute Mirror.
Dakotah Farmer.
Echo.

Farm and Fireside.
Farmer's Bulletin.
Farm, Herd, and Home.
Flint Globe.
Grand Rapids Post.
Grand Rapids Times.
Georgia Experiment Station.
Grand Haven Herald.
Greenville Independent.
Hillsdale Standard.
Industrialist.
Ingham County News.
Illinois Crop Reports.
Imports and Exports of the United States.
Jackson Daily Citizen.
Kalamazoo Telegraph.
Lancet.
Little Granger.
Lansing Sentinel.
Lansing Journal.
Locomotive.
LePatriote.
Midland Republican.
Midland Sun.
Monroe Commercial.
Naturalist's Monthly Bulletin.
New England Farmer.
Our Own Home.
Owosso Times.
Reed City News.
Romeo Observer.
Saginaw Morning Herald.
St. Louis Leader.
Scientific Roll.
SanDiego Union.
South Carolina Crop Reports.
Three Rivers Tribune.
Traverse Bay Eagle.
Weekly Globe and Canadian Farmer.

By subscription—Foreign	27
American	58
By donation	67
Whole number of periodicals received	152

The following bound volumes have been received as donations:

From the Department of State, Washington, D. C.

Life of A. S. Williams.
Index of Congressional Record, vol. 10, parts 1–5.
War of Rebellion—Union and Confederate Armies.
Commercial Relations of the United States with Foreign Nations.
Reports of U. S. Consuls on Commerce, Manufacturing, etc.
Messages and Documents—War Department, vol. 4, 1879.

Hon. Mark S. Brewer, Pontiac.

War of the Rebellion, official series, and 2.
Smithsonian Institute Report, 1879.
U. S. Fish Commission, 1876, 1877.

Mrs. Harriet A. Tenney, State Librarian, Lansing.

U. S. Statutes of 46th Congress, 2d session.
Mich. Reports, vols. 38 to 47.
Mich. State Library Catalogue, 1881–2.
U. S. Statutes passed at 3d session of 46th Congress, 1880–1.

Brig. Gen. S. D. Bennet, Washington, D. C.

Report of Chief of Ordnance, 1880.

Sen. H. P. Baldwin, Detroit.

Report of Commissioner of Education.
Congressional Reports, vols. 8, 9, 10, and 11.

Diseases of Animals, 3 vols.
Report of Fish Commissioner.
Report of Entomological Commission.
Report on the Metric System.
Smithsonian Report.
Life of A. S. Williams.
Life of Zachariah Chandler.

Hon. Wm. Jenney, Secretary of State, Lansing.

Foreign Relations of the United States and President's Message, 1879.
Eighth Registration Report of Michigan—Vital Statistics.
Joint Documents of Michigan, 1879.
Report of Michigan Commissioner of Railroads.
Michigan Manual, 1881.
Michigan Public Acts, 1881.

Prof. Simon Newcomb, Annapolis, Md.

American Ephemeris and Nautical Almanac, 1883.
Standard Stars.

Hon. F. Langelier, Treas., Quebec.

Sessional Papers of Province of Quebec.

Hon. C. W. Garfield, Secretary, Grand Rapids.

Michigan Pomological Society, 1880.

Secretary of the Interior, Washington, D. C.

Department of Agriculture, 1879.
Geology of High Plateaus of Utah.
Geological and Geographical Survey of Territories of U. S., vols. 5 and 6.
History of North American Pinnipeds.
Report of Commissioner of Education.
U. S. Geological and Geographical Survey.
Geological Survey of the Territories.
Second Report of U. S. Entomological Commissioner, 1878–9.
Report of Board of Indian Commissioners, 1881.

Hon. L. S. Lamay, Ontario, P. O.

Journals of Legislative Councils, vol. xiv, '80.
Sessional Papers, vols. 13 and 14.

Rev. H. S. McMaster.

Inebriety—Its Influence and Vital Criminal Statistics.

Secretary of War, Washington, D. C.

Messages and Documents.
Report of Chief of Engineers, 1880, parts 1, 2, 3.
Report of Chief Signal Officer.

O. B. Galusha.

Ill. Horticultural Society, vols. 12, 13, 14.

Luther Tucker & Son, Albany, N. Y.

Register of Rural Affairs.

Hon. S. F. Baird, Secretary, Washington, D. C.

Smithsonian Miscellaneous Collections, vols. 16, 17, 18, 19, 20, 21.
Annual Report of Smithsonian Institute, 1879.

Superintendent of Coast Survey, Washington, D. C.

Vols. 1852, '54, '55, '56, '59, '61, '62, '65, '66, '67, '68, '69, '70, and Maps of U. S. Coast Survey.

Ginn & Heath, Boston.

Elements of Algebra. Wentworth.

H. A. Dyer, West Cornwall, Ct.

Transactions of Connecticut Agricultural Society, 1856.

Hon. H. S. Gould, Secretary, West Cornwall, Ct.

Connecticut Board of Agriculture and Experimental Station, 1880.

Hon. G. E. Bryant, Secretary, Madison, Wisconsin.

Wisconsin Agricultural Society, 1873, '74, '75, '76, '77, '78, '79, '80.

Hon. S. D. Fisher, Secretary, Springfield.

Illinois Department of Agriculture, vols. 16 and 17.
Transactions of Illinois Department of Agriculture, vols. 14, 15, 16.
Illinois Agricultural Report, 1880.

Hon. P. T. Quinn, Secretary, Newark, N. J.

New Jersey Board of Agriculture, 1881.

Hon. John R. Shaffer, Secretary, Fairfield, Iowa.

Iowa Agricultural Report, 1876, '77, '78, '79.

Hon. A. P. Butler, Columbia, S. C.

Report of Committee of Agriculture of South Carolina.

Prof. J. C. Holmes, Detroit.

Coleman's Tour, vols. 1 and 2.
Ohio Agricultural Reports, 1856, 1860, 1876.
Principles of Agriculture, by A. W. Shaw.
Gardener's Chronicle, 1852-3-4.
American Agriculturist, vols. 11 and 12.
California Farmer, vols. 3 and 4.
New England Farmer, vols. 10, 11, 12, 13; also, years 1821, '22, '29, '39, '40, '41, '42.
Iowa Farmer, vols. 1 and 2.
Diseases of Animals, by S. W. Cole.
Practical Drainage, by Munn.
Morrell's American Shepherd.
Prairie Farmer, vols. 14 and 15.
Journal of U. S. Agricultural Society, 1852, '55.
W. D. Cœrain's Farm Accounts.
F. B. Hough's " "
Report of Board of Agriculture of Maine, 1856, '57, 58, '59.
Transactions of Massachusetts Agricultural Society, 1852.

Massachusetts State Board of Agriculture, 1852.
Branches of Industry of Massachusetts, 1855.
Journal of Bath and West England Agricultural Society.

Hon. T. L. Harrison, Albany, N. Y.

Transactions of New York Agricultural Society.

Hon. Robert Manning, Secretary, Boston, Mass.

Massachusetts Horticultural Society, 1880, parts 1 and 2.

Hon. J. J. Woodman, Paw Paw.

Paris Mineral Exposition, vols. 1, 2, 3, 4, and 5.

Hon. T. J. Burrill, Champaign, Ill.

Industrial University of Illinois, 1880.

—— ———, *Clerk, Quebec.*

Journals of Legislative Assembly of Quebec, vol. 15.

G. C. Brackett.

Reports of Kansas Horticultural Society, 1877, '78, '79.

Department of Agriculture, Washington, D. C.

Annual Report of Department of Agriculture, 1880-1875.

Governor D. H. Jerome, Saginaw.

Michigan and Its Resources.

State Librarian of Maine, Augusta.

Agriculture of Maine, 1875.

Engineering Department of U. S. Army, Washington, D. C.

U. S. Geographical Survey.

J. A. Stoddard, Cooper, Mich.

Miscellaneous Poems.

Board of Geological Survey.

Geological Survey of Michigan.

L. S. Boardman, Secretary.

Agriculture of Maine.

Dr. W. J. Beal.

Indiana Horticultural Society, 1871, '77, and '81.
Michigan Horticultural Society, several volumes.

Prof. Simon Newcomb, Annapolis, Md.

Am. Ephemeris and Nautical Almanac.

Z. A. Gilbert, Secretary.

Board of Agriculture of Maine, 1878–1881.

Charles Folgar, Secretary.

Report of Treasury, Cattle Commission.

Hon. Alonzo Sessions, Ionia.

Representative Men of Michigan, 2 vols.

B. F. Barrett, Philadelphia.

Swedenborg Library, 10 vols.

F. S. Gold, West Cornwall, Conn.

Agriculture of Connecticut, 4 vols., 1857, '59, '79, and '81.

Hon. S. F. Baird, Sec., Washington, D. C.

Smithsonian Report, 1880.

Prof. C. H. Reeves, State College, Pa.

Agriculture of Pennsylvania.

S. B. Peer.

Sailing Summer and Winter.

Hon. Alex. Herron, Indianapolis.

Indiana Agricultural Reports, 1877, '79, '80.
Indiana Horticultural Society, 1881.

J. F. Crotty, Lansing.

Potter's Mechanics.

War Department, Washington, D. C.

Report of Chief of Engineers, 1881, 3 vols.

Dr. Henry B. Baker, Lansing.

Vital Statistics from Registration Report, 1 vol.

P. B. Richardson, Magnolia, Iowa.

Problem of Human Life—Here and Hereafter.

J. Buckingham (author).

American Devon Record, vols. 1 and 2.

Hon. O. D. Conger.

Ethnological Report.

B. F. Stevens, London, Eng.

General Catalogue of Books.

Sergeant J. P. Finley, Washington, D. C.

Tornadoes of May 29th and 39th, 1879.

Amherst College, Amherst, Mass.

Massachusetts Agricultural Report.
Unbound volumes presented to the Library:

President of the College, Ames, Iowa.

Annual Report Iowa Agricultural College.

Prof. Simon Newcomb, Annapolis, Md.

Astronomical Papers.

Prof. W. J. Beal, Secretary.

American Pomological Society, 1879 and 1881.

W. P. Schumper, Germany.

Biblitheca Schumperiana, 1881.

E. W. Stanton, Ames, Iowa.

Biennial Report of Iowa Agricultural College and Farm.

S. A. Forbes, Champagne, Ill.

Bulletin No. 3 Illinois State Laboratory.

Dr. T. W. Humes, Nashville.

Biennial Report of the Tennessee University.

A. W. Hawkins.

Biennial Report of the Commissioner of Agriculture of Tennessee.

—— ———, *Secretary.*

Bulletin of Essex Institute.

Department of Interior.

Bulletin U. S. Geological and Geographical Survey.

R. Buist, Jr., Philadelphia.

Buist's Garden Manual, 1882.

Department of Agriculture, Washington, D. C.

Contagious Diseases of Domestic Animals.

Trustees.

College Quarterly for November, Iowa Agricultural College.

J. B. Root, Rockford, Illinois.

Catalogue of J. B. Root's Vegetables and Flowers.

Peter Henderson and Co., New York.

Catalogue of Seeds and Plants, 1882.

Joseph Harris, Rochester, New York.

Catalogue of Seeds for Garden, 1882.

Dr. Henry B. Baker, Lansing.

Contagious Diseases: Scarlet Fever, Diphtheria, Small Pox, etc.

War Department, Washington, D. C.

Construction and Maintenance of Time Balls. Chronological List of Auroras June, 1870, to 1879.

Agricultural Academy of Verona, Italy.

Carta Geologica Diverona.

F. W. Christem, New York.

Catalogues of Foreign Periodicals.

Chief Engineers War Department.

Decrease of Water in Springs, etc.

Trustees.

Experimental of Agricultural Department, University of Tennessee.

Prof. Henry, Supt. of the Experimental Farm, Madison, Wis.

Experiments in Amber Cane, and Ensilage.

Hon. S. S. Benedict.

Entomological Bulletin Nos. 2 and 6, Department Interior.
A Farmer's Views of Education.

Hon. N. W. Winchell, State Geologist, Minneapolis, Minn.

Geological and Natural History Survey of Minnesota, 1879.
Geological and Natural History Survey of Minnesota, numbers 6, 7, and 8.
Geological and Natural History Survey of Minnesota.

John P. Headley, Jr., Washington, D. C.

How to Make a Shoe.

President of Historical Society of New Mexico.

Inaugural Address of Hon. W. S. Ritch.

Chief of Engineer War Department, Washington, D. C.

Index to Report of Chief of Engineers.

Legislature of Idaho, Boise City.

Idaho Territory.

Hon. Jno. R. Shaffer, Secretary, Fairfield, Iowa.

Iowa Monthly Crop Report.

War Department, Washington, D. C.

Isothermal Lines of the United States, 1871-'80.

Hon. S. D. Fisher, Springfield.

Illinois Crop Prospect, 1882.

Chief Engineer United States, Washington, D. C.

Lectures on Improvement of Danube at Vienna.

Hon. H. S. Evans, Secretary, Montreal.

Montreal Horticultural Society, 1879.

Hon. H. S. Evans, Secretary, Quebec, P. Q.

Memorie Dell' Accademia D'Agricultura Arti.
E. Commercia Di Berona. Vol. 59, della seri 2.
Report of the Montreal Horticultural Society and Fruit-Growers' Association of Quebec.

I. F. Tillinghast.

Magazine Seed Time and Harvest, 1882.

Hon. P. T. Quinn, Newark, N. J.

New Jersey Agricultural Reports, 1874, '76, '77, '78, '79, '81, '82.

Bureau of Navigation Navy Department.

Nautical Almanac, 1880.

Hon. W. I. Chamberlain, Secretary, Columbus, O.

Ohio Crop Report with Analysis of Fertilizers.

Adjutant of the Academy, West Point, N. Y.

Official Register of Officers and Cadets of the West Point Military Academy.

Hon. W. J. Baxter, Jonesville, Mich.

Proceedings of Annual Conferences of Charities.

Bureau of Statistics, Washington, D. C.

Quarterly Report No. 4, 1879, '80.

Department Treasury, Washington, D. C.

Quarterly Report of Bureau of Statistics to 1881.

Hon. Hiram Cutling.

Report of University of Vermont, 1775, '76.

Bureau of Statistics, Washington, D. C.

Report of Statistics for June, July, and August.

Trustees.

Report of McDonald Educational Fund.

A. J. Murray, Secretary.

Report of Cattle Commissioners of Michigan.

Prof. J. Henry Comstock, Ithica, N. Y.

Report of Entomologist of the U. S. Dept. of Agriculture, 3 vols.

Department of Interior, Washington, D. C.

Report of Commissioner of Patents.

Prof. C. H. Reves, Librarian State College, Center Co., Pa.

Report of Pennsylvania State College, 1881.

Hon. F. D. Coburn, Topeka, Kansas.

Report of Kansas State Board of Agriculture, 1881.

E. B. Read, London, Ont.

Report of Entomological Society.

H. C. Dallam, Baltimore.

Report of McDonough Institute.

Secretary of University, Minneapolis, Minn.

Report of University of Minnesota, vol. 1 and 2.

Albert Griffin.

Sketch Book of Riley Co., Kansas.

Senator H. P. Baldwin, Detroit.

State of Labor in Europe.

Michigan Board of Health, Lansing.

Scientific Rolls, nos. 1, 2, 3, 4, and 5.

Department of Interior, Washington, D. C.

Statistics of Iron and Steel Product of the United States.

R. B. Warder, Cincinnati, O.

Scientific Proceedings of the Ohio Mechanics' Institute.

Prof. R. C. Carpenter.

Surveyors and Civil Engineers.

Hon. Robert Manning, Secretary, Boston, Mass.

Transactions of Massachusetts Horticultural Society, 1880.
Transactions of Massachusetts Horticultural Society, parts I and II, '81.

Hon. H. S. Evans, Secretary, Montreal.

Transactions of Montreal Horticultural Society.

Hon. Justin S. Morrill.

Tariff Speech of.

National Association of Wool Manufacturers.

The Premises of Free Trade Examined.

War Department, Washington, D. C.

The Reduction of Air Pressure.

Hartford Steam Boiler Company, Hartford, Conn.

The Locomotive.

Sergeant J. P. Finley, Washington, D. C.

Tornadoes, Character of 600.

Prof. Simon Newcomb, Annapolis, Md.

Velocity of Light, vol. 1, part 3.

Hon. Wm. E. Chandler, Secretary of Navy, Washington, D. C.

Venus, Instructions for Observing the Transit, December 6, 1882.

List of Pamphlets, presented by Sir John Bennet Lawes, Bart. of St. Albans, England.

Lawes and Gilbert.

On the Amount and Composition of the Rain and Drainage Waters of Rathamstead.

Robert Warrington.

On the Determination of Nitric Acid in Soils. (From a report of experiments made in Rathamstead laboratory.)

Determination of Nitric Acid as Nitrous Oxide by Reaction with Ferrous Salts. (Experiments made in Rathamstead laboratory),—by Robert Warrington.

Note on the Appearance of Nitrous Acid during the Evaporation of Water. (From report of experiments made in Rathamstead laboratory),—by Robert Warrington.

On the Determination of Carbon in Soils. (Report as above),—by Warrington and Peake.

On the Determination of Nitric Acid by means of Indigo, with special reference to Water Analysis. (Report as above).

On the Determination of Nitric Acid as Nitric Oxide by means of its Action on Mercury. (Report as above).

On Nitrification, Part I.
" " " II.

Memoranda of Origin, Plan, and Results of the Field and other Experiments conducted on the Farm and in the Laboratory of Sir John Bennet Lawes, Bart., LL. D., F. R. S., at Rathamstead, Hertfordshire, England.

J. B. Lawes.

Exhaustion of the Soil, in relation to Landlord's Covenants, and the Valuation of Exhausted Improvements.

On Rainfall: Evaporation and Percolation,—by J. H. Gilbert.

Mr. Lawes, 1876.

On some Points in Connection with Animal Nutrition,—by Dr. Gilbert.

Mr. Lawes, 1876.

On some Points in Connection with Vegetation,—by Gilbert.

From Mr. Lawes.

Freedom in the Growth and Sale of the Crops of the Farm, considered in relation to the interests of the Landowner and the Tenant Farmer.

From Mr. Lawes.

On the Connection between the Manures on the Farm and Artificial Manures.

From Mr. Lawes.

On the Formation of Fat in the Animal body.

From Mr. Lawes.

On Nitrification. By Warrington.

From Mr. Lawes.

On Nitrification. By R. Warrington.

From Mr. Lawes.

Food in its Relations to various exigencies of the Animal Body.

From Mr. Lawes.

Is higher Farming a Remedy for Lower Prices?

Lawes and Gilbert.

On the Equivalency of Starch and Sugar in Food.

From Mr. Lawes.

On the Chemistry of the Feeding of Animals for the Production of Meat and Manure.

From Mr. Lawes.

Memoranda of the Origin, Plan, and Results of the Field and other Experiments on farm and in Laboratory of Mr. Lawes, with statement of present and previous cropping, of the arable land not under experiment.

Agricultural, Botanical, and Chemical results of experiments of the mixed herbage of permanent meadows, conducted for more than twenty years in succession on the same land. Part I. By Lawes & Gilbert.

REPORT OF THE DEPARTMENT OF HISTORY AND POLITICAL ECONOMY.

To the President:

The following report of work in this department during the academic years 1881-2 is respectfully submitted:

POLITICAL ECONOMY.

Instruction in this subject is given in the spring term of the Senior year. The daily recitations are constantly supplemented with familiar oral expositions of the topics in hand, with citations from and reference to standard writers. The aim of the instruction is to accomplish three purposes, which may be briefly stated: first, to give a historical sketch of the development of economic ideas; second, to present the leading principles of the science in a clear light through an examination of the phenomena of production, distribution, and exchange; third, to make a candid study of some of the more prominent economic problems of the day, as Transportation, the Tariff, Industrial Reform. In 1881 the course covered six weeks; the text-book used was Perry's "Introduction to Political Economy;" thirty students formed the class. In the present year twelve weeks were given to the study; Chapin's revision of Wayland was the text-book; the class consisted of twenty-seven students.

CONSTITUTION OF THE UNITED STATES.

This course is given to Seniors and occupies six weeks of the spring term. An attempt is made to secure not only a knowledge of the Constitution as it is, but also a historical study of its leading principles as to their origin and purpose. This involves a review of the salient points in our political history. Cooley's "Principles of Constitutional Law" has been used as a text-book. In 1882 the class consisted of twenty-four members, several others taking special examinations. The study has been transferred since 1881 from the Department of Philosophy.

MORAL PHILOSOPHY.

A six weeks' course in this subject was given to the Seniors in 1881, with Bascom's "Science of Duty" as a text-book. The study is no longer included in this department.

HISTORY.

Throughout the first term of the Freshman year the study of ancient history is pursued. The course embraces a sketch of the ancient Oriental Monarchies, an outline of the history of Greece and Rome to the downfall of the Western Empire, and the beginnings of the Middle Ages. Swinton's "Outlines of the World's History" has been used as the basis of instruction; but constant references are made to larger works, and the habit of independent study is fostered by the assignment of special topics to individual students. These topics are in biography, mythology, and the manners and customs of the ancients. The results of such study are presented in the class. In 1881 there were fifty-six students in the course, who met in two divisions. In the previous year Mr. Henry E. Owen, under the direction of the Professor of Botany and Horticulture, taught this class.

An advanced course of historical lectures will be read to the Seniors during a half term, when the changes in the curriculum now going on are complete.

The following work, assigned from the Department of English, has been done:

RHETORIC.

A twelve weeks' course was given to the Freshmen during the summer term of each year, with Day's "Rhetorical Praxis" as text-book. Exercises in composition were also required about once a fortnight. These were read by the writers in the presence of the class and were orally criticised by the instructor; and in many cases private instruction upon them was given in addition to the examination and correction of manuscript. The class met every day in two divisions.

HIGHER ENGLISH.

The character of this study is described by the Professor of the English Language and Literature. Throughout the spring term, 1882, daily instruction was given to twenty-six students of the Sophomore class, Swinton's "Studies in English Literature" being the text-book used.

RHETORICALS.

Besides the rhetorical work connected with the last two subjects, the following has been assigned to me. The method of instruction has been described above.

The Seniors met once a week in the spring term of 1881, each student presenting two themes. In the summer term of each year two original speeches were delivered by each member of the Sophomore class. Throughout the autumn term, 1881, the Sophomores met once a week to present declamations and essays. Three exercises were required of each. The Juniors also met once a week, each student presenting two themes. During the spring term, 1882, the Freshmen met every Saturday, in two divisions, for a critical reading of selections from Addison. An understanding of the thought and proper elocution were both kept in view. Written abstracts of the essays studied were also prepared.

Attention is called to the large number of written exercises subjected to critical examination. In one term over three hundred papers were presented. Many of these were returned for a second writing, after which they were examined a second time. This work, together with private consultation concerning choice of themes and sources of information, and private individual criticism, involves many hours outside of the class-room. It is believed that it is no exaggeration to say that thus comes additional work not appearing in the scheme of studies, but equivalent to more than two hours of daily class-room work. Much of this labor in connection with essays is peculiarly trying and exhaustive, but it is believed that it cannot but result in great good to the student.

The time devoted to history in the curriculum is unhappily very short. There will, indeed, be an addition of six weeks, when the changes now in progress are completed; but, even then, a single term and one-half will still be so inadeqate that it is extremely desirable that more time be given, if that can be done without injury to other work. At least a term should be given to the study of modern history.

Within the period covered by this report considerable additions have been made to the Library of books relating to this department. Many gaps, however, especially in important periods of history, remain unfilled. There is also great need of illustrative apparatus for the work in history. If a small sum of money could be laid out in the purchase of charts, and plans, and views illustrative of classical and oriental art and antiquities, of manners and customs, the work of the student would be made much more interesting and profitable.

I have only to add that I read a lecture before the Institutes held at Lapeer and Macon in the months of January and February, 1882, and have taken my turn in the Wednesday afternoon lectures at the College.

G. H. HARROWER.

LAWS RELATING TO THE COLLEGE.

CONSTITUTIONAL PROVISIONS.

The Agricultural College of the State of Michigan was established in obedience to a requisition of the Revised Constitution of the State, adopted 15th August, 1850, which requisition may be found in Art. 13:

"SEC. 11. The Legislature shall encourage the promotion of intellectual, scientific, and agricultural improvement; and shall, as soon as practicable, provide for the establishment of an Agricultural school. The Legislature may appropriate the twenty-two sections of Salt Spring Lands now unappropriated, or the money arising from the sale of the same, where such lands have been already sold, and any land which may hereafter be granted or appropriated for such purpose, for the support and maintenance of such school, and may make the same a branch of the University for instruction in agriculture and the natural sciences connected therewith, and place the same under the supervision of the Regents of the University."

ACT OF ORGANIZATION.

The act of organization of the State Agricultural College was approved Feb. 12, 1855, and provided:

1. That the president and executive committee of the State Agricultural Society be authorized to select, subject to the approval of the State Board of Education, a location and site for a State Agricultural College.
2. To be within ten miles of Lansing.
3. Not to cost over $15 an acre.
4. The conveyance to be made to the State.

*5. Appropriated twenty-two sections of Salt Spring lands for the purchase of lands, erection of buildings, etc.

6. The College was committed to the charge of the State Board of Education.
7. Detailed objects of instruction; the date of beginning and end of each of the two scholastic terms of the year; provided for manual labor; that tuition should be free.
8. A treasurer was to do the work now done by the secretary of the College.

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*The minimum price for these Salt Spring lands, $56,320, was paid over at once to the State Board of Education for the College.

ACT OF REORGANIZATION.

An act of reorganization of the Michigan State Agricultural College was approved March 15, 1861. As amended the law now reads as follows, the sections being numbered according to the Compiled Laws and according to the laws 1861, act No. 188:

THE STATE AGRICULTURAL COLLEGE.

AN ACT to reorganize the Agricultural College of the State of Michigan, and to establish a State Board of Agriculture.

[Approved March 15, 1861. Laws of 1861, p. 307.]

SECTION 1. *The People of the State of Michigan enact, that a board is hereby constituted and established, which shall be known under the name and style of the "State Board of Agriculture." It shall consist of six members besides the Governor of the State and the president of the State Agricultural College, who shall be ex officio members of the board, the Governor, by and with the consent of the senate, on or before the third Wednesday of January of each biennial session, shall appoint two suitable persons to fill the vacancies that shall next occur, which vacancies shall be so filled that at least one-half the members shall be practical agriculturists.

SEC. 2. (Comp. Laws, § 3533.) The State Board of Agriculture shall be a body corporate, capable in law of suing and being sued, of taking, holding, and selling personal and real estate, of contracting and being contracted with, of having and using a corporate seal, and of causing to be done all things necessary to carry out the provisions of this act.

SEC. 3. (Comp. Laws, § 3534.) Any vacancy in the said Board, caused by death, resignation, or removal from the State, may be filled by a majority of the members. A majority shall be a quorum for the transaction of business. The members of the Board shall receive no per diem compensation for their services, but shall be paid their traveling and other expenses while employed on the business of the Board.

SEC. 4. (Comp. Laws, § 3535, amended 1873, No. 145, § 4.) They shall meet quarterly at stated times at the State Agricultural College, and may meet at such other times and places as they may determine.

SEC. 5. (Comp. Laws § 3536.) At their first meeting the members shall choose one of their number as president of their own Board.

SEC. 6. (Comp. Laws, § 3537.) At their first meeting, or as soon after as a competent and suitable person can be obtained, they shall choose a secretary of the Board. If chosen from their own number, a vacancy shall be thus created in the Board. A treasurer shall also be chosen at their first meeting, who may or may not be from the members of their Board, as they shall determine. They shall also take such bonds from the secretary and treasurer as shall be deemed adequate to secure the faithful performance of their duties by those respective officers. The secretary and treasurer shall be chosen biennially,

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*Comp. Laws § 3532, as amended by Act 145 of the Laws of 1873, p. 194, approved April 24, 1873.

and shall hold their offices for two years from the last Wednesday of February or until their successors are chosen.

SEC. 7. (Comp. Laws, § 3538.) The Board shall direct the disposition of any moneys appropriated to the State Agricultural College.

SEC. 8. (Comp. Laws, § 3539.) The Secretary of the Board shall reside at or near the Agricultural College, and keep his office at the city of Lansing, in the State buildings, or at the Institution, as the Board shall direct. It shall be his duty to keep a record of the transactions of the State Board of Agriculture, and of the State Agricultural College and farms, which shall be open at all times to the inspection of any citizens of this State. He shall also have the custody of all books, papers, documents, and other property which may be deposited in his office, including specimens of the vegetable and animal kingdoms of the State or counties; also, keep and file all reports which may be made from time to time by county and State Agricultural and Horticultural Societies, and all correspondence of the office from other persons and societies appertaining to the general business of husbandry; address circulars to societies, and the best practical farmers in the State and elsewhere, with the view of eliciting information upon the newest and best mode of culture of those products, vegetables, trees, etc., adapted to the soil and climate of this State; also, on all subjects connected with field culture, horticulture, stock-raising, and the dairy. He shall encourage the formation of agricultural societies throughout the State, and purchase, receive, and distribute such rare and valuable seeds, plants, shrubbery, and trees as it may be in his power to procure from the general government and other sources, as may be adapted to our climate and soils. He shall also encourage the importation of improved breeds of horses, cattle, sheep, hogs, and other live stock, and the invention and improvement of labor-saving implements of husbandry, and diffuse information in relation to the same. He shall encourage such domestic industry and household arts as are calculated to promote the general thrift, wealth, and resources of the State. To effect those objects he shall correspond with the Patent Office at Washington, and representatives of our national government abroad, and if possible procure valuable contributions to agriculture from those sources. He shall aid, as far as possible, in obtaining contributions to the museums and the Library of the State Agricultural College, and thus aid in the promotion of agriculture, science, and literature.

SEC. 9. (Comp. Laws § 3540.) The seeds, plants, trees, and shrubbery received by the Secretary, and not needed by the College, shall be, so far af possible, distributed equally throughout the State, and placed in the hands of those farmers and others who will agree to cultivate them properly, and return to the Secretary's office a reasonable proportion of the products thereof, with a full statement of the mode of cultivation, and such other information as may be necessary to ascertain their value for general cultivation in the State. Information in regard to agriculture may be published by him, from time to time, in the newspapers of the State, provided it does not involve any expense to the State.

[Sec. 10, Comp. Laws § 3541, provided for reports and their distribution. It has been repealed, and its purposes provided for in Act No. 52, 1879, as to the printing and distribution of reports, and Act 206, Laws 1881, for the making of reports.]

SEC. 11. (Comp. Laws § 3542.) The secretary shall receive, as a compensation for his services, a salary of one thousand dollars per annum, to be paid quarterly from the State treasury, in the same manner as is provided by law for the payment of the salaries of State officers.

[Sec. 12, Comp. Laws § 3543, made an appropriation for secretary's expenditures for 1861 and 1862. The money was not drawn from the State treasury.]

Sec. 13. (Comp. Laws, § 3544.) The State Agricultural School, established by act number one hundred and thirty, Session Laws of eighteen hundred and fifty-five, in obedience to section eleven of article thirteen of the Constitution, shall be known by the name and style of "The State Agricultural College." The design of the institution, in fulfillment of the injunction of the Constitution, is to afford thorough instruction in agriculture, and the natural sciences connected therewith. To effect that object most completely, the institution shall combine physical with intellectual education, and shall be a high seminary of learning, in which the graduate of the common school can commence, pursue, and finish a course of study, terminating in thorough theoretic and practical instruction in those sciences and arts which bear directly upon agriculture and kindred industrial pursuits.

Sec. 14. (Comp. Laws, § 3545.) No student shall be admitted to the institution who is not fifteen years of age, and who does not pass a satisfactory examination in arithmetic, geography, grammar, reading, spelling, and penmanship.

Sec. 15. (Comp. Laws, § 3546.) The course of instruction shall embrace the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural, and household economy, horticulture, moral philosophy, history, book-keeping, and especially the application of science and the mechanic arts to practical agriculture in the field.

Sec. 16. (Comp. Laws, § 3547.) A full course of study in the institution shall embrace not less than four years. The State Board of Agriculture may institute winter courses of lectures for others than students of the institution, under necessary rules and regulations.

Sec. 17. (Comp. Laws, § 3548.) The academical year shall consist of not less than nine calendar months. This academical year may be divided into such terms by the State Board of Agriculture as, in their judgment, will best secure the objects for which the College was founded. The Board may, at any time, temporarily suspend the College in case of fire, the prevalence of fatal diseases, or other unforeseen calamity.

Sec. 18. (Comp. Laws, § 3549.) Three hours of each day shall be devoted by every student of the College to labor upon the farm, and no person shall be exempt except for physical disability. By a vote of the Board of Agriculture, at such seasons and in such exigencies as demand it, the hours of labor may be increased to four hours, or diminished to two and one-half hours.

Sec. 19. (Comp. Laws, § 3550.) The State Board of Agriculture shall be vested with discretion to charge tuition or not as they may deem most conducive to the interests of the institution, unless acts of the Legislature, making appropriations for its support, shall otherwise direct. The Board may make discriminations in regard to tuition between students from this State and from other States. One-third of the tuition charged for the academic term shall be paid in advance, and shall be forfeited in case the student abandons the institution.

SEC. 20. (Comp. Laws, § 3551.) The State Board of Agriculture shall have the general control and supervision of the State Agricultural College, the farm pertaining thereto, and lands which may be vested in the College by State legislation; of all appropriations made by the State for the support of the same [and also the management of any lands that may hereafter be donated by the general government to this State, in trust for the promotion of agriculture and industrial pursuits]. The Board shall have plenary power to adopt all such ordinances, by-laws, and regulations, not in conflict with this act, as they may deem necessary to secure the successful operation of the College and promote its designed objects. [NOTE.—The portion in brackets has been superseded, so far as pertains to the Congressional grant of 1862, by subsequent legislation.]

SEC. 21. (Comp. Laws, § 3552.) It shall be the duty of the State Board of Agriculture to choose a president of the State Agricultural College before the commencement of the next term of the institution; they shall then proceed to choose such professors, tutors, and employés as the necessities of the institution demand. In case of vacancy in the office of president, or in case a suitable man cannot be selected, the president of the State Board of Agriculture, or such member of the Board as shall be designated by them, shall be president *pro tem.* of the College, who shall receive such compensation for his services as the Board shall determine.

SEC. 22. (Comp. Laws, § 3553.) The Board shall fix the salaries of the president, professors, and other employés, and prescribe their respective duties. The Board may remove the president or subordinate officers, and supply any vacancies.

SEC. 23. (Comp. Laws, § 3554.) The Board shall have power to regulate the course of instruction, and prescribe, with the advice of the faculty, the books to be used in the institution; and also to confer, for similar or equal attainments, similar degrees or testimonials to those conferred by the University of Michigan.

SEC. 24. (Comp. Laws, § 3555.) The president, professors, farm manager, and tutors shall constitute the faculty of the State Agricultural College. The president of the College shall be the president of the faculty. The secretary of the State Board of Agriculture shall be a member and secretary of the faculty.

SEC. 25. (Comp. Laws, § 3556.) The faculty shall pass all needful rules and regulations necessary to the government and discipline of the College, regulating the routine of labor, study, meals, and the duties and exercises, and all such rules and regulations as are necessary to the preservation of morals, decorum, and health.

SEC. 26. (Comp. Laws, § 3557.) The faculty shall have charge of the laboratories, library, and museums of the institution.

SEC. 27. (Comp. Laws, § 3558.) The faculty shall make an annual report by the first Wednesday of December of each year to the State Board of Agriculture, signed by the president and secretary, containing such information and recommendations as the welfare of the institution, in their opinion, demands. Any members of the faculty may make a minority report if they disagree with the conclusions of the majority, which the faculty shall communicate to the Board. No communication at any other time, from members of the faculty, shall be entertained by the Board, unless they have been submitted to a meeting of the faculty and sanctioned by a majority. [NOTE.—

Has this section been superseded by Act 206, Laws 1881? The Attorney General makes no reference to it in a communication to the Board, etc.]

Sec. 28. (Comp. Laws, § 3559.) The President shall be the chief executive officer of the State Agricultural College, and it shall be his duty to see that the rules and regulations of the State Board of Agriculture, and the rules and regulations of the faculty be observed and executed.

Sec. 29. (Comp. Laws, § 3560.) The subordinate officers and employés, not members of the faculty, shall be under the direction of the President, and in the recess of the Board, removable at his discretion, and he may supply vacancies that may be thus or otherwise created. His action in these respects shall be submitted to the approval of the State Board of Agriculture at their next meeting.

Sec. 30. (Comp. Laws, § 3561.) The President may or may not perform the duties of a professor, as the State Board of Agriculture shall determine. If he performs the duties of a professor, or in case the duties of president are exercised by a president *pro tem.*, a superintendent of the farm may be appointed, who shall have the general superintendence of the business pertaining to the farm, the land, and other property of the institution, and who shall be a member of the faculty.

Sec. 31. (Comp. Laws, § 3562.) The President and Secretary, together with the Superintendent of the farm, if there be one, and in case there is not one, then one of the professors to be elected by the faculty, shall constitute a committee to fix the rate of wages allowed to students, and rate of board. In assessing the board it shall be so estimated that no profit shall be saved to the institution, and as near as possible at the actual cost. The rates of wages allowed, and rate of charge for board shall, if practicable, be submitted to the State Board of Agriculture before they take effect.

Sec. 32. (Comp. Laws § 3563.) For current expenditures at the State Agricultural College, specific sums shall be set aside, in the hands of their treasurer, by the State Board of Agriculture, which shall be subject to the warrants of the President of the College, countersigned by the Secretary. All moneys due to the institution or received in its behalf shall be collected and received by the Secretary, and deposited by him with the treasurer of the State Board of Agriculture. The Secretary shall, with his annual report, render a full and complete account of all moneys received and all warrants drawn on the treasurer, as Secretary of the College, and shall file and preserve all vouchers, receipts, correspondence, or other papers relating thereto.

Sec. 33. (Comp. Laws, § 3564, as amended, Laws 1875, Act 221.) The superintendents of the farm, horticultural, and other departments, the curators of the museums, and each of the professors shall make a written and detailed report of the workings of their several departments annually to the president of the College, which said report shall be kept on file in the office of the secretary of the State Board of Agriculture. Agricultural operations on the farm shall be carried on experimentally. Careful experiments shall be made annually in field crops, in keeping, feeding, and fattening stock, and in the preparation and application of barn-yard and commercial manures, and a detailed account of them shall be published in the annual reports of the Board. The College shall serve also as an experimental station, making trial from time to time of new varieties of fruits, grains, and vegetables. The reports shall contain an account of the management of all the several fields, pastures, orchards, and gardens of the College, as designated by permanent names or numbers, and shall give an account of the preparation and enriching of the land, the planting, cultivation, harvesting, and yield of the crops and disposition of the same; the management of the stock, with a careful comparison of the cost of keeping, growth, and profit of the several breeds kept on the farm; also, an account of the students' labor, specifying the amount used in each of the several departments of the College, with other details, in such a way that the reports, as issued from year to year, shall contain a continuous history of the College, farm, and garden: Provided, That the State Board of Agriculture shall deem the same practicable or advisable.

SEC. 34. (Comp. Laws, § 3565.) All the swamp lands granted to the State of Michigan by act of Congress, approved September twenty-eight, one thousand eight hundred and fifty, situate in the townships of Lansing and Meridian, in the county of Ingham, and DeWitt and Bath, in the county of Clinton, of which no sale has been made, or for which no certificates of sale have been issued by the Commissioner of the Land Office, are hereby granted and vested in the State Board of Agriculture and placed in the possession of the State Agricultural College, for the exclusive use and benefit of the institution, subject only to the provisions relating to drainage and reclamation of the act of Congress donating the same to the State.

SEC. 35. (Comp. Laws, § 3566.) The State Board of Agriculture shall have authority to sell and dispose of any portions of the swamp lands mentioned in the preceding section of this act, and use the same or the proceeds thereof for the purpose of draining, fencing, or in any manner improving such other portions of said lands as it may be deemed advisable to bring under a high state of cultivation for the promotion of the objects of the State Agricultural College. The terms and conditions of the sale of the portions of the above described lands thus disposed of shall be prescribed by the State Board of Agriculture, and deeds of the same, executed and acknowledged, in their official capacity, by the president and secretary of the State Board of Agriculture, shall be good and valid in law.

SEC. 36. (Comp. Laws, § 3567.) David Carpenter of Lenawee county; Justus Gage of Cass county; Philo Parsons of Wayne county; Hezekiah G. Wells of Kalamazoo county; Silas A. Yerkes of Kent county, and Charles Rich of Lapeer county are hereby constituted and appointed the first State Board of Agriculture. At their first meeting, which the Governor of the State is hereby authorized and directed to call at as early a day as practicable, they shall determine by lot their several periods of service, two of whom shall serve for two years, two of whom shall serve for four years, and two of whom shall serve for six years, respectively, from the third Wednesday of January last past, when they are superseded by appointments, in accordance with the provisions of Section one of this act, or until their successors are chosen.

SEC. 37. (Comp. Laws, § 3568.) Act number one hundred and thirty, Session Laws of eighteen hundred and fifty-five, being an act for the establishment of a State Agricultural School, and all other acts or parts of acts in conflict with the provisions of this act, are hereby repealed.

SEC. 38. (Comp. Laws, § 3569.) This act shall take immediate effect.

Approved March 15, 1861.

LAW REGARDING REPORTS. NO. 206. PUBLIC ACTS 1881.

AN ACT to provide for the uniform regulation of certain State institutions, and to repeal section seven of act number one hundred and forty-eight of the session laws of eighteen hundred and seventy-three, act one hundred and sixty-two of the session laws of eighteen hundred and seventy-three, act number thirty-one of the session laws of eighteen hundred and seventy-five, section seventeen of act number two hundred and thirteen of the session laws of eighteen hundred and seventy-five, section seventeen of act number one hundred and seventy-six, of the session laws of eighteen hundred and seventy-seven, section sixteen of act number one hundred and thirty-three of the session laws of eighteen hundred and seventy-nine, section twenty of act number two hundred and fifty of the session laws of eighteen hundred and seventy-nine, and all acts or parts of acts contravening the provisions of this act.

SECTION 1. *The People of the State of Michigan enact*, That all educational, charitable, reformatory, and penal institutions, supported wholly or in part by the State, shall be known as State institutions.

SEC. 2. The Board of each State institution shall, by the first day of November preceding the regular sessions of the Legislature, make out and present to the Governor a detailed statement of the operations of the institutions for the two fiscal years closing on the thirtieth day of the preceding September, which shall include the report of the Superintendent, Warden, or other proper chief officer, for the same period, and a report of the Treasurer of all receipts and disbursements made during the same period, which report shall be furnished the State printer for publication by the first day of November of the year when made. That such reports shall show at the time of making the same, in detail, the number and names of the various professors, superintendents, officials, and all other regular employés, and the wages or salary paid to each, and what, if any, other emoluments are allowed, and to whom. The Boards of each State institution, which is essentially educational in character, shall also annually, before the first day of November, make out and present to the Superintendent of Public Instruction a manuscript report showing:

First. The condition of the educational interests of the Institution;

Second. The number and names of the various professors, tutors, and instructors;

Third. The number of students or pupils in the several departments, and in the different classes;

Fourth. The courses of study pursued, and the books of instruction used.

Fifth. Such other information and suggestions as said Board may deem important, or the Superintendent of Public Instruction may request, to embody in his annual report.

SEC. 3. That the Board of each State institution shall cause a full and accurate inventory, in duplicate, to be taken at the close of its fiscal year next preceding the regular biennial session of the Legislature, by the officer in charge, which shall specify the number of acres of land and the value thereof, the number, kind, and value of buildings, the various kinds of personal property and the value thereof, which inventory shall be signed by the officer making the same, and certified as correct by the Board for which it is made; one copy of which shall be made in a proper record book to be kept for that purpose in the institution, and the other shall be filed in the office of the Secretary of State by the first day of November of the year when made. Any Board of any State institution may in its discretion cause such property to be appraised on oath, by two disinterested and competent appraisers, to be appointed for that purpose by the Board, and a summary of each inventory made shall be published in the biennial report.

SEC. 4. Every educational, charitable, penal, and reformatory institution, shall, in proper books for that purpose, keep a regular account of all moneys received and disbursed, and the receipts from and expenditures for and on account of each department of business, or for the construction of buildings, or the improvement of the premises; and in those institutions where farming and gardening operations are carried on, the accounts will be so kept as to show, as near as practicable, the cost of carrying on the farm or garden and the quantity and value of the productions of the same, with the cost of live stock raised or fattened for the use of the institution, and the quantity and value thereof, and where manufacturing operations are carried on, the cost and result of each separate branch of manufacture, and the quality and value of all manufactured articles sold or used in the institution, so as to clearly exhibit the receipts and expenditures in each department of business carried on in the institution, and the cost of educating and maintaining each student or inmate therein. That the accounts of receipts and disbursements in all State institutions shall conform as near as may be practicable to a uniform system, and to accomplish this result the Auditor General is authorized to prescribe such a system of accounts as he shall deem proper for said institutions, which shall secure as near as may be such uniformity.

SEC. 5. The accounts of members of Boards of State institutions for official expenses and services, or either, where allowed by law, shall first be certified to be correct by the Board to which the member belongs, and then shall be audited by the Board of State Auditors and paid from the general fund.

SEC. 6. The Boards of State institutions shall, in their biennial reports, recommend what amounts in its opinion is needed for the next two years for ordinary current expenses and for special purposes by the institution so reporting, with the reasons for such recommendations. [The rest of section 6 and sections 7 and 8 are not applicable to the State Agricultural College.]

SEC. 9. Section seven of act number one-hundred and forty-eight of the session laws of eighteen hundred and seventy-three, act one hundred and sixty-two of the session laws of eighteen hundred and seventy-three, act number thirty-one of the session laws of eighteen hundred and seventy-five, section seventeen of act number two hundred and thirteen of the session laws of eighteen hundred and seventy-five, section seventeen of act number one hundred and seventy-six of the session laws of eighteen hundred and seventy-seven, section sixteen of act number one hundred and thirty-three of the session laws of eighteen hundred and seventy-nine, section twenty of act number two hundred and fifty of the session laws of eighteen hundred and seventy-nine, and all acts or parts of acts contravening the provisions of this act are hereby repealed: *Provided,* That nothing in this act shall be construed as amending or repealing any act or part of acts providing for financial reports by any of said State institutions to the Auditor General, Board of State Auditors, or to any other State officer, as now provided by law.

Approved June 2, 1881.

DISTRIBUTION OF REPORTS.

[Act No. 52, Laws 1879, so far as relates to the making of a report, is repealed, but do not its provisions remain in force regarding the distribution of the reports required in Act 206, Laws 1881?]

SECTION 10. The State Board of Agriculture shall report, etc. [v. Act 206, Laws 1881]. Eight thousand copies of this report shall be printed and bound annually, prior to the first day of June, and shall immediately be placed at the disposal of the State Board of Agriculture; four thousand copies is to be distributed by the secretary of said State Board of Agriculture as the Board shall direct, and the remaining four thousand copies to be distributed prior to the first day of September after publication, by the secretary of the Board, to the secretaries of the various district and county societies as equally as may be, according to the population of said counties, to be by said secretaries distributed among the various viewing committees of county and district fairs, giving one volume of said report to each of said committees as shall be present and discharge the duties of the office on the day of the county and district fairs; and in addition to the foregoing there shall be published a number of copies of said report equal to the number of reports bound as joint documents, which shall be disposed of in the same manner as the joint documents.

MILITARY DEPARTMENT.

AN ACT to establish a military school in connection with the Agricultural College.

(3569.) SECTION 1. *The People of the State of Michigan enact,* That in addition to the course of instruction already provided by law for the Agricultural College of the State there shall be added military tactics and military engineering.

(3570.) SEC. 2. The State Board of Agriculture are hereby authorized and required to make such additional rules and regulations for the government and control of the Agricultural College as may be necessary to carry into effect the provisions of section one of this act.

(3571.) SEC. 3. The State Board of Agriculture shall, by and with the advice and consent of the Governor, the Adjutant General, and Quartermaster General, procure, at the expense of the State, all such arms, accoutrements, books, and instruments, and appoint such additional professors and instructors as, in their discretion, may be necessary to carry into effect the provisions of this act: *Provided,* That nothing in this act shall be construed to authorize the incurring of any indebtedness against the State, or the expenditure of money beyond the appropriations made to the Agricultural College.

Approved March 20, 1863.

LAWS OF CONGRESS.

AN ACT donating Public Lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Mechanic Arts.

Be it enacted by the Senate and House of Representatives of the United

States of America, in Congress assembled, That there be granted to the several States, for the purposes hereinafter mentioned, an amount of public land, to be apportioned to each State, a quantity equal to 30,000 acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of 1860: *Provided,* That no mineral lands shall be selected or purchased under the provisions of this act.

SEC. 2. *And be it further enacted,* That the land aforesaid, after being surveyed, shall be apportioned to the several States in sections or subdivisions of sections, not less than one-quarter of a section; and wherever there are public lands in a State, subject to sale at private entry at one dollar and twenty-five cents per acre, the quantity to which said State shall be entitled, shall be selected from such lands, within the limits of such State; and the Secretary of the Interior is hereby directed to issue to each of the States, in which there is not the quantity of public lands subject to sale at private entry, at one dollar and twenty-five cents per acre, to which said State may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share; said scrip to be sold by said States, and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other use or purpose whatsoever: *Provided,* That in no case shall any State to which land scrip may thus be issued, be allowed to locate the same within the limits of any other State, or of any territory of the United States; but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry, at one dollar and twenty-five cents, or less, an acre: *And provided further,* That not more than one million acres shall be located by such assignees in any one of the States: *And provided further,* That no such location shall be made before one year from the passage of this act.

SEC. 3. *And be it further enacted,* That all the expenses of management, superintendence and taxes from date of selection of said lands, previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the States to which they may belong, out of the Treasury of said States, so that the entire proceeds of the sale of said lands shall be applied, without any diminution whatever, to the purposes hereinafter mentioned.

SEC. 4. *And be it further enacted,* That all moneys derived from the sale of the lands aforesaid, by the States to which the lands are apportioned, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except so far as may be provided in Section fifth of this act, and the interest of which shall be inviolably appropriated, by each State, which may take and claim the benefit of this act, to the endowment, support, and maintenance of, at least, one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

SEC. 5. *And be it further enacted,* That the grant of land and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States shall be signified by legislative acts:

First. If any portion of the fund invested, as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum, not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purchase of lands for sites or experimental farms whenever authorized by the respective Legislatures of said States;

Second. No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair, of any building or buildings;

Third. Any State which may take and claim the benefit of the provisions of this act shall provide, within five years, at least not less than one college, as prescribed in the fourth section of this act, or the grant to such State shall cease; and said State shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchasers under the State shall be valid;

Fourth. An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their cost and results, and such other matters, including State industrial and economical statistics, as may be supposed useful; one copy of which shall be transmitted by mail free, by each, to all the other colleges which may be endowed under the provisions of this act, and also one copy to the Secretary of the Interior;

Fifth. When lands shall be selected from those which have been raised to double the minimum price in consequence of railroad grants, they shall be computed to the States at the maximum price, and the number of acres proportionally diminished;

Sixth. No State, while in a condition of rebellion or insurrection against the government of the United States, shall be entitled to the benefit of this act;

Seventh. No State shall be entitled to the benefits of this act, unless it shall express its acceptance thereof by its Legislature within two years from the date of its approval by the President.

SEC. 6. *And be it further enacted,* That land scrip issued under the provisions of this act shall not be subject to location until after the first day of January, 1863.

SEC. 7. *And be it further enacted,* That land officers shall receive the same fees for locating land scrip issued under the provisions of this act as is now allowed for the location of military bounty land warrants under existing laws: *Provided,* That maximum compensation shall not be thereby increased.

SEC. 8. *And be it further enacted,* That the Governors of the several States to which scrip shall be issued under this act shall be required to report annually to Congress all sales made of such scrip until the whole shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

Approved July, 1861.

[NOTE.—The time for accepting the provisions of this act was subsequently extended and provisions made for new States.]

MILITARY OFFICERS.

Thirty-Ninth Congress, Session I, Chapter 299.

SEC. 26. *And be it further enacted*, That for the purpose of promoting knowledge of military science among the young men of the United States, the President may, upon the application of an established college or university, within the United States, with sufficient capacity to educate at one time not less than one hundred and fifty male students, detail an officer of the army to act as President, Superintendent, or Professor of such college or university; that the number of officers so detailed shall not exceed * thirty at any time, and shall be apportioned through the United States as nearly as practicable according to population, and shall be governed by general rules, to be prescribed from time to time by the President.

Approved July 28, 1866.

Forty-Fourth Congress, Session I, Chapter 167.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That Section twelve hundred and twenty-five of the Revised Statutes of the United States be so amended as to read: "But the number of officers so detailed to colleges shall not exceed thirty at any time," instead of twenty, as in said section provided.

Approved July 5, 1876.

Forty-Sixth Congress, Session I, Chapter 81.

Ordnance Department.—That upon the application of any college, university, or institution of learning incorporated under the laws of any State within the United States, having capacity at the same time to educate not less than one hundred and fifty male students, the President may detail an officer of the army in the retired list, to act as President, Superintendent, or Professor thereof, and such officer may receive from the institution to which he may be detailed the difference between his retired and full pay, and shall not receive any additional pay or allowance from the United States.

Approved May 4, 1880.

STATE ACCEPTANCE OF THE UNITED STATES GRANT.

[Act No. 171, Laws 1859.]

AN ACT to accept grants of land from the United States to this State, for the benefit of agriculture and the mechanic arts.

Whereas, There is now pending before the Congress of the United States a bill granting and donating to the several States portions of the public lands for the benefit of agriculture and the mechanic arts, and it is anticipated that the same or some similar bill for such purposes will be passed and becom a law at the present or some future session of Congress; therefore,

(3924.) SEC. 1. *The People of the State of Michigan enact*, That this State hereby accepts and assents to any such grant or donation of lands, or of land scrip now made, or which may hereafter be made by Congress, to this State, for those or the like purposes, upon the terms, trusts, and conditions upon which such grant or donation is, or may be made; which terms, trusts, and conditions are hereby declared to be obligatory on this State, and the Governor is hereby authorized to determine the value of such lands, and to select the same, if that be in accordance with the act or acts of Congress, and to report his doings in this behalf to the proper department of the Government of the United States.

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* As amended Act approved July 5, 1876.

SEC. 2. This act shall take effect and be in force immediately.

Approved February 14, 1859.

[Act No. 46, Laws 1863.]

AN ACT for the acceptance of the donation of public lands made by act of Congress, approved July second, eighteen hundred and sixty-two, providing for the endowment of colleges for the benefit of agriculture and the mechanic arts.

(3926.) SECTION 1. *The People of the State of Michigan enact,* That the grant of land accruing to the State of Michigan, under and by virtue of an act of Congress donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts, approved July second, eighteen hundred and sixty-two, be and the same is hereby accepted in accordance with all the conditions and provisions in said act contained.

SEC. 2. This act shall take immediate effect.

Approved February 25, 1863.

SELECTION AND DISPOSITION OF LANDS.

[Act No. 140, Laws 1863.]

AN ACT to provide for the selection, care, and disposition of the lands donated to the State of Michigan by act of Congress, approved July second, eighteen hundred and sixty-two, for the endowment of colleges for the benefit of agriculture and the mechanic arts.

(3927.) SECTION 1. *The People of the State of Michigan enact,* That the Governor, the Auditor General, Secretary of State, State Treasurer, Attorney General, and Commissioner of the State Land Office shall constitute a board, to be known as the Agricultural Land Grant Board, and said Board shall have the control and management of the selection, the care and disposal of the lands granted to this State by act of Congress, approved July second, eighteen hundred and sixty-two, providing for the endowment of colleges for the benefit of agriculture and the mechanic arts. Said Board shall appoint one or more suitable commissioners, whose duty it shall be to select and locate, as soon as practicable, the quantity of land donated to this State by the act of Congress aforesaid, and to make returns of the lands so located to the Commissioner of the State Land office of Michigan, properly designated and described, and to notify the Registers of the United States District Land Offices, for the districts in which the selection and location is made, of such selection as fast as the land is so selected.

(3928.) SEC. 2. The Commissioner of the State Land Office shall, as fast as such selections are made and returned to him, forward to the Secretary of the Interior of the United States full and complete descriptions of all such lands, and obtain the necessary title to the State of Michigan for the same.

(3929.) SEC. 3. All of said lands, excepting as hereinafter provided, shall be sold for not less than three dollars* per acre, one-fourth of the purchase price to be paid at the time of purchase, and the balance at any time thereafter at the option of the purchaser, with interest on the unpaid balance at the rate of seven per cent per annum, payable annually into the State Treasury, in accordance with and subject to all the terms and conditions of payment, and forfeitures for non-payment of all interest and taxes due thereon, as is now provided by the laws regulating the sale and forfeiture of primary school lands: *Provided however*, That all of said lands which are valuable principally for the timber thereon, shall be sold for not less than five dollars per acre, the whole of the purchase money therefor to be paid at the date of purchase.

(3930.) SEC. 4. The proceeds of the sale of said land shall be applied and used according to the conditions of the act of Congress granting the same to the State.

(3931.) SEC. 5. Whenever said lands, or any part of them, shall have been selected, certified to the Commissioner of the State Land Office, withdrawn from market, and so marked on the plats, and certified by the Register of any United States Land Office for the proper district, by authority of the Commissioner of the General Land Office of the United States, the Commissioner of the State Land Office may, by direction of said Land Grant Board, sell said lands in quantities of not less than any legal subdivision, according to the original United States survey; and on each sale being made, the Commissioner of the State Land Office shall issue his certificate of sale in the usual form, setting forth the quantity and description of the land sold, the price per acre, the amount paid at the time of purchase, the balance due, with the annual rate of interest, and the time the interest is payable, as is required by law for the payment of interest on contracts for the purchase of primary school lands, and that the purchaser will be entitled to a patent from this State on payment in full of the principal and interest, together with all taxes assessed on such land.

(3932.) SEC. 6. Certificates of purchase issued pursuant to the provisions of law shall entitle the purchaser to the possession of the lands therein described, and shall be sufficient evidence of title to enable the purchaser, his heirs or assigns, to maintain actions of trespass for injuries done to the same, or ejectment, or any other proper action or proceeding to recover possession thereof, unless such certificate shall have become void by forfeiture; and all certificates of purchase in force may be recorded in the same manner that deeds of conveyance are authorized to be recorded.

(3933.) SEC. 7. The Governor of this State shall sign and cause to be issued patents for said lands, as soon as practicable after payment is made in full of principal, interest, and all taxes, as aforesaid.

(3934.) SEC. 8. The money received from the sale of said lands shall be paid into the State Treasury, and shall be placed in the general fund, but the amount thereof shall be placed to the credit of the Agricultural College fund upon the books of the Auditor General, and the annual interest thereon, computed at seven per cent, shall be regularly applied, under the direction of the State Board of Agriculture, to the support and maintenance of the State

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* Put at $5 April, 1881. See Report of Commissioner of Land Office, 1881.

Agricultural College, where the leading object shall be,—without excluding other scientific and classical studies, and including military tactics,—to teach such branches of learning as are related to agricultural and mechanic arts, in order to promote the liberal and practical education of industrial classes in the several pursuits and professions of life.

(3935.) SEC. 9. The said Land Grant Board shall, on finding that there is not in this State a sufficient amount of land belonging to the United States, subject to private entry to make up the full amount of the land granted by said act of Congress, notify the Commissioner of the United States Land Office of the fact, and obtain, as soon as practicable, from the proper authority, permission to select an amount sufficient to make up such deficiency from United States lands in other States or Territories of the United States, and shall send one or more Commissioners into such States or Territories to select the same, under such rules and regulations as said Board may prescribe.

(3936.) SEC. 10. The Agricultural Land Grant Board shall certify, from time to time, to the Auditor General, the amounts required to pay expenses of selecting and locating and making returns of said lands, and the Auditor General shall draw his warrant upon the State Treasurer for the amounts thus certified, and the State Treasurer shall pay the same out of the general fund. Said Land Grant Board may make such rules and regulations in relation to the time and manner of selecting and locating the lands, making the returns and keeping the accounts of expenses, as they may deem necessary and proper. All contracts and certificates of said Board shall be signed by the Chairman, and countersigned by the Secretary of the Agricultural Land Grant Board.

(3937.) SEC. 11. In the sale of lands, the principal value of which consists in the timber, the Commissioner of the State Land Office shall require the payment of the entire amount of purchase money at the time of purchase, or such portion of the same above one-fourth as he may deem for the best interest of the State.

SEC. 12. This act shall take immediate effect.

Approved March 18, 1863.

OTHER PROVISIONS OF LAW.

The members of the State Board of Agriculture, like those of the boards of other institutions are (Act No. 107, 1873) prohibited from being personally interested, directly or indirectly, in any contract, purchase, or sale made for, or in account, or in behalf of the institution.

The Library is entitled to certain reports, a copy of the laws of the United State, as issued from year to year, and to duplicates from the Geological Survey of the State.

STUDENTS' GOVERNMENT.

From "College Rules" adopted by the Faculty, last edition, 1878:

"60. The College recognizes the 'Students' Government' as a part of the government of the College.

"61. The rules of the 'Students' Government,' when approved by the Faculty and announced to the students, shall form a part of the laws for the government of the College.

"62. The Faculty retain the right to take cognizance in their discretion of any case of misdoings brought to their notice.

"63. The faculty reserve the right to resume the authority granted to the Students' Government whenever it shall fail properly to perform its functions, or to maintain good order.

CONSTITUTION.

Adopted by the students, August, 1882, in place of the Constitution and Rules given in College Rules, 1878:

I. Object.—The prime object shall be the maintenance of good order within the dormitories, and the general comfort of students in pursuit of study.

II. Domain. The halls used as dormitories shall be divided into several districts, as follows:

A. Williams Hall, 3d floor, 1 to 10 east.
B. " " 3d floor, 11 to 20 south.
C. " " 2d floor, 21 to 30 east.
D. " " 2d floor, 31 to 40 south.
E. Wells Hall, East ward, 61 to 82.
F. " " center ward, 83 to 106.
G. " " west ward, 107 to 129.

III. Officers.—The President, Secretary, and Legal Board of the Students' Organization shall act as President, Secretary, and Legal Board for the Students' Government.

Each district shall elect by ballot, on the second Saturday of each term, one Captain and one Lieutenant.

All of the above officers shall be installed by the approval of the President of the College. No student under censure shall be eligible to office.

In case any District fail to elect officers at the appointed time, or within three days thereafter, said officers shall be appointed by the President of the College, and the President and Secretary of the Students' Government.

IV. Duties.—The President of the Students' Government shall arrange for all trials, shall act as judge at all trials, and in case of the absence of the Secretary, shall perform the duties of that officer.

The Secretary shall act as the clerk of the court, shall report the result of all trials to the Faculty, shall report the results of all elections, or appointments of officers to the Faculty at its next regular meeting; shall see that all students are duly notified of the time and place for the election of officers; shall inform all officers of their election, selection, or appointment; as soon as they are qualified shall notify jurymen of their appointment, and in the absence of the President shall perform the duties of that officer.

Each Captain or his Lieutenant shall make it his first duty to prevent all disturbance within his district.

It shall be the duty of each and all of these officers to secure a gentlemanly deportment from all students everywhere about the grounds, and especially toward visitors.

All cases of willful disregard of rules of good order he shall report immediately to the President of the Students' Government.

All the Captains and Lieutenants shall meet each week for consultation with the President of the College as to the general good order, and a written report of this meeting shall be made each week to the faculty of the College.

Any member of the Legal Board shall act as counsel for the prosecution at the request of the Captain, who reports the person to be tried, or for the defense, if requested to do so by the person to be put on trial.

V. RULES OF TRIAL.—(1.) Any person accused shall be tried before a jury to consist of six persons, who shall be drawn as follows: The names of all the students of the College, excepting those of the officers indicated above, shall be kept by the President of the Students' Government in a box, and said President shall draw out, in the presence of the accused, of the two counsels in the case, and the Secretary, at some previously designated time and place, the names of six persons.

In case the name of the person to be tried, or that of any student absent from the College is drawn, others shall be drawn till the requisite number is secured.

The Secretary shall at once notify the jurymen of their appointment, and of the place and time when the trial shall be held.

(2.) *Testimony.* Testimony of any competent witness may be taken, and the accused may be personally examined. Any member of the jury may give testimony and shall not thereby be debarred from voting on the case.

(3.) *Verdict.* Verdict and penalty shall be decided by a majority vote of all the jurymen, in close session, the President of the Students' Government having the casting vote.

VI. PENALTIES. The penalties shall consist of a definite number of marks of demerit upon the records of the Secretary.

An accumulation of five such marks shall bring a private warning from the President of the College; ten marks shall bring a second warning, with a notification of the fact to the friends of the student; fifteen marks shall be attended with a request for his withdrawal from College.

VII. RECORDS. The records of all trials shall be kept by the Secretary, and each week submitted to the faculty for approval.

VIII. APPEAL AND PARDON. The faculty shall reserve the right to hear appeals or to rectify all cases when necessary; also, to pardon and expunge demerit marks after proof of subsequent good conduct.

IX. RULES. Rules of good order shall be established by a majority of the captains and lieutenants, under the sanction of the faculty.

X. *In case any* district fails to preserve order, the President may reörganize it by change of students' rooms.

XI. AMENDMENTS. Any change in the above constitution shall be only by a vote of two-thirds of the students present at College.

FARMERS' INSTITUTES.

Hitherto the State Board of Agriculture has published an annual report, including in addition to a statement of the finances of the College and of its various departments of education and industry, a full account of the Farmers' Institutes held each year.

This, together with a few miscellaneous papers, and the report of the State Agricultural Society, make a volume usually of about six hundred pages.

The Legislature of 1881 passed an act requiring all State Institutions to publish biennial reports. In compliance with this provision of law, this report covers a period of two years (from September 30, 1880, to September 30, 1882), and the two series of Farmers' Institutes held during the winters of 1881–2 and 1882–3.

Instead of giving, as heretofore, a full report of each Institute, we give only a brief sketch of each, followed by a selection from the essays and lectures which were read, and of the discussions which followed the reading of some of them. This method will make the report less bulky and more convenient than it would otherwise be, while it has not been necessary to omit anything but papers and discussions similar to some of those published in previous reports

FARMERS' INSTITUTES HELD DURING THE WINTER OF 1881-2.

At a meeting of the State Board of Agriculture held November 21, 1881, the Committee on Farmers' Institutes presented the following report, which was adopted:

Your committee have been furnished by the Secretary with all the applications for Institutes received and filed in his office, and having considered the same, would recommend that during the approaching winter vacation of the College, Institutes be held as follows:

1. Cassopolis, Cass county, January 17 and 18, attended by Professors Kedzie and MacEwan, and President Abbot, and F. S. Kedzie.
2. Leslie, Ingham county, January 19 and 20, attended by Professors Beal, Johnson, Carpenter, and President Abbot.
3. Berlin, Ottawa county, January 24 and 25, attended by Professors Johnson, Beal, MacEwan, and Secretary Baird.
4. Greenville, Montcalm county, January 26 and 27, attended by Professors MacEwan, Beal, Kedzie, and President Abbot.
5. Lapeer, Lapeer county, January 30 and 31, attended by Secretary Baird, Professors Carpenter, Harrower, and Johnson.
6. Macon, Lenawee county, February 2 and 3, attended by Professors Carpenter, Kedzie, Harrower, and Secretary Baird.

J. WEBSTER CHILDS,
GEO. W. PHILLIPS,
Committee.

CASSOPOLIS INSTITUTE, JAN'Y 17 AND 18, 1882.

The first afternoon was occupied in miscellaneous business and the reading and discussion of papers on management of stock and chicken cholera.

The evening session opened with music by the choir, followed by an address of welcome by Hon. R. J. Dickson.

"Home Life" was then presented by Prof. MacEwan.

Mrs. Euna Ervin, of Colorado, then read an original poem idealizing a character selected from early Michigan history.

A general discussion of early pioneer life was entered upon, bringing out many pleasant remembrances of the hardships endured in the settlement of southern Michigan. Music. Adjournment.

MORNING SESSION.

Opened by some excellent music by the choir, after which sorghum culture was presented by F. S. Kedzie, followed by a discussion of the subject in which the experience generally went to show planting in hills was preferable to drilling, and the best quality and quantity were secured when the sorghum plant was thinned down to from three to four stalks to the hill.

L. B. Lawrence of Decatur then opened a discussion upon the subject "Shall we have road fences," urging that there was no economy in keeping fences along the highway for the sake of either the pasturage or convenience in transporting to market.

In the afternoon Dr. Kedzie presented his paper upon the composition of wheat at different periods of ripening, which was followed by a long discussion on the proper time for cutting wheat.

The evening session was occupied with an address by President Abbot on educational fallacies descended to us from the middle ages. After the opening and discussion of numerous questions from the question box the Institute was declared adjourned.

LESLIE INSTITUTE.

This institute was held January 19th and 20th, in Union Hall, and presided over by Mr. Luther Hasbrouck. The following programme was carried out:

AFTERNOON SESSION, 1:30 P. M.

Music.
Prayer by Rev. John Heritage.
Music.
Silos and Ensilage—the new way of keeping green fodder—Prof. S. Johnson.
Music.
Line Breeding and the Value of Pedigrees—A. F. Wood, Mason.
Music.

EVENING SESSION, 7 P. M.

Music.
Essay—Prof. H. C. Rankin, Leslie.
Music.
National Prosperity—Mrs. W. K. Sexton, Howell.
Music.
An Address—President T. C. Abbot.
Music.

MORNING SESSION, 10 A. M.—SHARP.

Music.
Prayer by Rev. L. DeLamarter.
Music.
Nobility of Labor—Mrs. Louisa Doxtader.
Life's Monuments—Miss Ida Hall.
Music.
The Advance of Time—Mrs. J. W. Lawrence, Fitchburg.
Lessons in Plant Growth—Prof. W. J. Beal.

AFTERNOON SESSION, 1:30 P. M.

Music.
The Duty of Farmers to Insure Against Loss by Fire—Elliot H. Angell, Bunker Hill.
Music.
The Transportation Question—Prof. R. C. Carpenter.

Connected with this institute there was an interesting exhibition of grain, vegetables and fruit.

The usual resolutions of thanks to those who had taken part in the institute were passed, and an instructive report was read on the grain, fruit, and other articles on exhibition. The attendance and the interest were excellent throughout. The music was in charge of W. D. Longyear, and reflected great credit on that gentleman and those associated with him. R. H. Davis had charge of the exhibits, and Luther Hasbrouck, Philander Doxtader and John Sigler were the committee of arrangements.

BERLIN INSTITUTE.

The institute at Berlin, Ottawa county, was held January 24th and 25th, and after music by the Berlin Cornet Band, and prayer by Rev. Wm. Tilley, Mr. W. F. Kelly, who presided, read the following opening address:

This, I believe, is the first Farmers' Institute ever held in Ottawa county. The objects of this gathering, as I understand them, are to enable the farmers and all persons interested in agriculture, to meet together for the purpose of discussing questions concerning the farm, to cultivate and build up a higher standard of sociability, and acquire a better knowledge and greater proficiency in the business in which we are engaged. It is for mental and social improvement then, that we have left our fields and our homes, and have come here to-day to consult together, and to contribute to one another's stock of knowledge what we have learned by observation and experience. Every intelligent farmer can learn from the experience of his neighbor, and teach his neighbor in return.

The history of the world from its early ages down to the present time, shows that man has been a student, slowly but steadily making advance in the knowledge of the laws which govern and control matter. Every point gained, every truth discovered, enables succeeding generations, by availing themselves of them, to advance more rapidly than their predecessors. These advances have been but mere improvements on the ideas and practices of the past, and have in their time yielded to still further improvement upon them. The improvement of yesterday is superseded by that of to-day, and the advancement of to-day will be obsolete on the morrow. Nothing is stationary, nothing fixed, nothing perfect. Improvement and development is written upon everything human. This law governs in all the manifold relations of life. But in the great march of time and progress we believe that the husbandman has not kept abreast with men of other vocations in social and intellectual improvement. He is not held in the same esteem as men of other professions. In his isolated condition he has devoted the most of his time and energies to increasing the fertility and productions of the soil, and given little or no attention to the cultivation of his mind. His calling has not attained that predominant and commanding position in the affairs of State and nation which its importance rightfully deserves. It is universally conceded that agriculture is as important as all other industries combined. It is the foundation of every enterprise, and the leading interest of our people. It is to the abundance of agricultural productions that we are mainly indebted for our present prosperity as a nation. No people in history have made subsubstantial and permanent progress in civilization, arts, and sciences, that neglected to foster agriculture. It is the most ancient and universal of all pursuits, the parent of commerce and manufactures, the great nursing mother of individual and national prosperity.

Gentlemen, what an inspiration there is in the thought that the stability, permanence, and prosperity of the whole nation rests more certainly upon the success of the farmer than upon that of any other class or profession. That it is mainly by his industry, perseverance, and enterprise our country has been transformed from a wilderness wild to a nation of unexampled prosperity and power. Being numerically greater than all other classes and representing an industry which is the foundation of nearly all national wealth, his mental and social improvement, and the elevation of his calling to the dignity of a profession, are questions of earnest solicitude.

He should have schools and colleges where his sons can be educated for the business they are designed to follow, where the science peculiarly applicable to agriculture shall be taught, where the head and the hand shall be trained together, and men qualified for the practical business of farm life. This is an age of progress, and if the farmer would be the peer of any class or profession in mental culture, political and social influence, he must encourage the Farmers' Institute and all organizations having for their object the elevation of his calling and the promotion of his general welfare.

At the Institute men and women assemble who are engaged in kindred occupations and pursuits, whose interests, associations, and aspirations are identical, and who are alike interested in the advancement of everything that pertains to rural life. Here, questions of vital interest to the husbandman can be discussed, the different methods of farming compared, and the result of practical experiments made known to all. The benefits of the Institute to the farming community as a medium for the dissemination of practical and useful knowledge was recognized by our Legislature last winter, as the appropriation for that purpose will attest. And now, ladies and gentlemen, I have briefly stated to you the objects of the Institute as I understand them.

In conclusion, permit me, in behalf of the farmers of this vicinity, to bid you all a hearty welcome, especially the professors of our Agricultural College from whom we expect to hear something worth treasuring in our minds. All in attendance are cordially invited to participate in the discussions and give each question a proper ventilation. We do not expect to hear any great oratory, but a plain statement of facts. After the reading of each paper or delivery of speeches, time will be given for asking questions, and for free and full discussions. Good attention and quietness is essential and respectfully asked.

The band then played another piece, after which Mr. John Preston, of Alpine, read an essay on the subject of "Under Drainage." The subject was discussed by Messrs. Willard, Preston, Johnson, Wilde, and others.

Prof. S. Johnson read a paper on "Silos and Ensilage," which occupied the remainder of the afternoon.

At the evening session Mr. J. W. Kelley read a paper entitled

BE MASTERS OF YOUR SITUATION,

and Prof. E. J. MacEwan a lecture entitled

HOME.

The forenoon session of the second day was occupied by Prof. Beal, who gave a lecture on lessons in

PLANT GROWTH,

followed by numerous questions, which were answered by the Professor. As this lecture cannot well be separated from the ample illustrations by charts and off-hand drawings on the blackboard which accompanied it, it will not be published in full. We therefore give the following abstract of it here:

The Professor said: Most plants are fixed in the spot where they grow, most animals move freely from place to place, yet the reverse is true in some plants and in some animals. Bark lice, oysters, barnacles, corals, move about when very young, but become fixed in one spot as they become older. In one sense all growth is a slow motion. Plants bend towards the light. Roots bend towards the dark. The young root—the first root of Indian corn swings or rotates around as it grows forward. It sometimes makes a coil. In some cases the first root grows in a horizontal position; in rare cases it grows straight up. This can be shown by fastening with a pin to a stick growing leaves of corn over water in a dark place. Roots have nothing like intelligence. They do not search for food. Fine small roots are put out in every direction. Those roots which find proper nourishment grow best and gerd out branches which branch again. In this way the best ground is fed all over. The sap in cells circulates around in streaming currents. This can be seen in the sting of a nettle, the prickles of squash vines, the young briars at the tip of a wheat kernel. When ripe and dry the pods of many kinds of plants burst and throw the seeds for some distance. This is done by a quick motion. The cones of pines open to let pollen in to fertilize the seeds. The scales close till the seeds are ripe, and open again to let the seeds escape. The pistils of the violet, witch hazel, crane's-bill, balsam, and many other plants burst quickly and thus throw the seeds broadcast in every direction. The stem of the squirting cucumber comes off and the juice squirts the seeds out the opening for some distance. The leaves of white clover, lupine, oxalis, and a vast number of other plants take one position in the night, another in the day time. Many flowers open and close more than once. The pistils of eel-grass grow on long stems which let them to the top of the water, where pollen fertilizes them. After this the stem coils spirally and draws the pistil under water where it is ripened. Many other water plants do the same thing. A hop vine or morning glory gets up by spirally twining about a stick or string. It swings once around in an hour or two in warm weather. When it gets to the top of a stake it lops over horizontally, reaches out several feet, and will catch anything within reach in any direction. Grape vines will do the same thing. A tendril of squash vine can be seen to move in a warm day if it is irritated a little. The leaves and leaflets of sensitive plants go to sleep, as we say, every night. If brushed or jarred they will close at any time and then slowly open again. Some plants close up the leaf quickly to catch and devour flies which light on them. In some plants small, sticky glands move up, catch and retain, and digest the small insects. This is true of the gunden common in our swamps. There are no plants in Michigan large enough to catch and devour men, or even children in this way. The stamens or the pistils or other parts of many flowers move quickly in some definite way to aid in fertilization by insects. Some very small plants live in the water and consist of one minute cell, which has the power of swimming against the current. This is true of diatoms and desmids. The seeds or fruit of erodium much resemble those of our wild geranium. At one end of the seed is a spiral point or arm which bends off at right angles at the top. This seed has a sharp point at the base. When wet the arm untwists and becomes straight; when it dries the arm coils up again. In this way the seed often buries itself deep in the sand. It is often quite troublesome on sheep in California, where it bores into the skin as it twists and untwists in the wool with alternate wetting and drying. Plants have no nerves. They move by a change in the size or shape of some of the cells. Just how this comes about is not known. There is no end to observations and experiments which have been made on the motions of plants, and there is much yet to learn. Some of the practical bearings of this topic have been pointed out, others are just beginning to dawn on the minds of botanists. An abstract fails to give a fair conception of this interesting and instructive lecture, which was greatly appreciated by the audience.

The afternoon session began with a further explanation of the silo at the Agricultural College, by Professor Johnson. Samples were examined. Much interest was shown by the farmers in this subject.

Mrs. A. V. Weatherwax read an essay entitled "Farmers' Relation to our Common Schools." She urged paying more attention to this subject. She referred to the school system of our State as it formerly existed, and as it now exists. We need more competent school officers, better school-houses, and neater surroundings. The air is often sickening for the want of ventilation. The people are liberal in giving money for schools, but they do not see that it is well expended. Much time of the teacher and pupils is often lost for the want of some simple conveniences. The best place in which to give temperance lectures is to the small children in our schools.

R. G. Baird, Secretary of the State Board of Agriculture, gave an address on the

After which resolutions were passed, thanking all who took part or attended the Institute, which closed with much enthusiasm.

GREENVILLE INSTITUTE.

This Institute was held January 26 and 27, in Moore's Hall. Although the weather was unfavorable, a good audience was assembled at the hour of opening.

Dr. John Avery presided and delivered the following opening address:

Ladies and Gentlemen: When I was asked to preside at this Institute, I promised to not make a speech or deliver an address, and I intend to keep my word. But I should do injustice to my own feelings and to the occasion, if I did not extend to you all a hearty welcome to Greenville, to this hall, and to all the privileges and benefits of this institute.

In its conception and organization, this institute, like others of its kind, aims to interest and instruct you, the representatives of agriculture in this vicinity. And I welcome you with added pleasure, because I see in them the dawn of a better era for farmers and farmers' wives. I see in them the emancipation of the farmer from the continued drudgery of the past, and his elevation into that broader, higher, and purer life to which applied science is steadily lifting the profession of agriculture.

Other professions hold their institutes and profit by them; why not the farmer? Teachers, physicians, lawyers, ministers, and even undertakers, meet together, organize societies, exchange views, and discuss topics of interest to themselves and to their patrons. The farmer alone has been content to move along by himself, learning nothing from a regular interchange of ideas with his neighbors, and but little from experience, for experience teaches only those who record her lessons and compare them one with another, and with what others have gathered from her. His yearly show of overgrown pumpkins and squashes, at the time of the annual pool-selling and jockey races, has hitherto been his only associated attempt at improvement.

Ideas like electrical sparks are evolved by friction. We need to come in contact with each other in order to be sharpened and polished. We can each learn something from the other. Franklin got his first ideas of electricity from an ignorant Scotchman. The wisest may always learn something even from the less informed.

The physician who is content to plod along through life without association with his neighboring physicians, reading nothing but the books he read while studying his profession, trusting to experience to carry him through tight places, will ere long find himself traveling in a circle and unable to extricate himself from the ruts into which he dropped when he commenced practice. But if he meets his fellow practitioners in consultation, in society meetings, in medical institutes, compares the lessons of his experience with those of others, he gathers up a little from each, profits by the knowledge of all with whom he comes in contact, and what is of more importance, learns how to profit by his own experience. If in addition to these means of improvement, he takes at least one good journal devoted to the interests of his profession, he is prepared to take his place in the front rank, and each day's experience adds value to his services. What is true of the physician is true of the teacher, the minister, the farmer, and of every profession in life. And these institutes, or farmers' meetings, are a recognition of the benefits of association, and are to the farmer what medical institutes are to the physician, and teachers' institutes to the teacher.

One man has been successful in raising wheat; he comes here and tells of his soil and how he prepares it; the kind and quantity of seed; the time of seeding; the time and manner of harvesting and threshing; the kind and quantity of fertilizers, if any, he uses; and we compare his methods with our own; see where we have erred and use the light of his experience to guide us in the future. Another gives his experience in raising corn; another in raising oats, barley, or potatoes; and we are each taught by the other, and go to our homes not only better farmers but broader and better men, having learned one of the most important lessons of life: How to make the knowledge of those around us contribute to our own pleasure and profit.

These institutes are a recognition of another fact—that success in farming does not wholly depend upon unremitting physical labor, but like success in every other profession or pursuit in life, upon work guided by intelligence. And in order that this intelligence shall come in contact with and be instructed by the best thought and the best practice of his time, in addition to these associations each farmer needs and must have at least one good paper devoted to agriculture and its collateral sciences. He can no more afford to do without it than the physician, the minister, or the teacher without his.

But I do not by any means disparage work. This is indeed a busy world; work is required at the hands of every man that succeeds in it. I know of no profession that offers success to its votaries on any other condition than as the reward of hard work. The man who starts out with only his ax and a wife and attempts to hew for himself a home from the forest, has many hard days' work before him before he reaches that competency that shall afford him comfort and ease in the down-hill journey of life. But he has evenings at home with his family, his books, and his papers. He has nights of repose; and more than all, he has that sense of security that comes of a knowledge that his property is reasonably secure from accidents, and that each hour while he sleeps adds to its growth and value.

And again these institutes are evidence that the farmer is asserting for himself and his family that place in society to which he is justly entitled as a member of the oldest and most honorable profession among men. No, not the most honorable. For every useful profession is alike honorable. Useful labor is honorable everywhere, and in every man and woman. There is no honor, nor can there be, in idleness; it is simply rust or dry rot. No profession or pursuit in life can honor its members; the member must honor and dignify the profession; and society everywhere will respect the man who respects himself and honors his profession.

By meeting together in these institutes and listening to the experience of each other and to the voice of science as it recounts its triumphs won for your profession from year to year; giving you the results of experiments that, as individuals, you never could have made; compelling the forces of nature to do your bidding and to work for you, you dignify farming by elevating it to its place among the learned professions. Here, at these meetings, your agricultural college, the child of your fostering care and the pride of the State, brings back to you in the shape of well established truths, results of scientific experiments and sound advice, all the money you have contributed for its support, with compound interest added. Let us then, one and all, encourage its professors to continue in their good work, and ask them to meet us at our yearly institutes and exhibit for our benefit the garnered fruits of each year's labor.

Let us do one thing more, and insist that the Legislature shall so increase the accommodations of the college, that our daughters shall share on equal terms the benefits of its institution. We will not ask that they shall be taught to hold the plow, or handle the hoe or the scythe, or to drive the reaper or the mower, or to do any of the coarser work of the farm; but they may learn to do it all if they choose; and much of it, with the improved machinery of the day, they can do as well as men. But let them be taught practical horticulture and floriculture and bee-keeping and butter making, and we shall soon see this education asserting itself in the improvement of the farmer's garden, the adornment of his home, and the opening up of new and profitable industries for women. There is not a village in the State of three thousand inhabitants that does not offer a fair support to a practical florist. Add to this bee-keeping and you have an industry in which any lady, with proper education, can engage with almost absolute assurance of success. These are industries in which women can compete with men without any compromise of womanly modesty or dignity, and without any loss of womanly attractiveness.

But over and above all these and of vastly more importance to both women and to men, stands the fine art of cookery; and I insist that there shall be a kitchen department added to the agricultural college, where this fine art shall be taught; and let us all unite in one determined effort to rescue this art from the Biddies and Bridgets of to-day, and elevate it to its proper place among the accomplishments of our daughters. It will add much to the interest of the young man who is learning how to raise nice beefsteak to know that his girl is, at the same time, learning how to cook it, for to that ordeal it must come at last; and if spoiled in cooking, it has been raised and slaughtered in vain. It is as true to-day as ever, that we must all eat to live. Tanner may find weak imitators now and then, but he will hardly succeed in making fasting popular; and so the real test of good husbandry is when its products are brought to the table; and what does it profit a man to raise good wheat and get poor bread, to raise fat beef and eat beefsteak fried in lard, or to raise good peas and have them spoiled in making poor, very poor coffee? So let us have the kitchen department with its professor; not one of these with us to-night, but a bright, neatly attired, and thoroughly informed educated lady to preside over it.

And let the lessons in cooking be made to include the art of buying or selecting. For, disguise it as we will, when we get fairly settled down to the everyday duties of life, the marketing falls to the lot of the wife. And how shall she know how to select, what and how much to buy, and what to pay, unless she has been taught. And though in this respect there is less responsibility for the farmer's wife than for the mechanic's or the wife of the professional man, yet they all need just this accomplishment; and the time is coming when no woman will be regarded as thoroughly educated who does not possess this accomplishment. Here in Michigan to-day we are raising the finest beef, mutton, pork, and poultry in the world, and the best cereals and the finest vegetables; and yet one-half of all that is consumed at home is spoiled in cooking—nay, more than that; much of it is spoiled before it is brought to the kitchen, for the want of the proper knowledge of how to preserve it. And this information I would have included in the lessons on cookery in the college. How often now do we see nice, tender beef, for use in the family, cut up, packed in barrels, and each layer covered with salt in the same manner as broadside pork is preserved; and when it comes out it is as dry, hard, and tasteless as white-oak chips, and just about as digestible. Mutton and ham are treated in the same way. Of course no woman can cook such meat so as to make it fit for the table; it is simply spoiled before it reaches the kitchen.

Prof. E. J. MacEwan gave his lecture on

HOME.

At the close of this lecture Secretary Baird led in a discussion, taking up points in Dr. Avery's lecture and in the lecture of Prof. MacEwan, cooking, rearing children, well-regulated home life, fine dress, and the use of slang.

E. F. Grabill complimented the lecture of Prof. MacEwan highly as a whole. Its picture of home was beautiful and he hoped it might be realized more and more in country and town. He strongly condemned the use of slang and thought its use sadly demoralizing to the conception as well as the expression of truth. He even doubted the propriety of its use in a public lecture by way of illustration.

Supt. E. P. Church of the city schools, enjoyed the picture of the ideal home and hoped it would soon be classed among the attainable things of life. He would be glad to secure a prescription never failing to secure in children courtesy toward each other and the use of good language. The example of parents will do much to secure these desirable things in children. Prof. MacEwan had incidentally contrasted the culture of the east with that of the west, highly complimenting New England manners. Prof. Church, who has mingled with people of both sections, on the other hand, thought that western people are more polite, have better manners, and are possessed of more real culture than people even of Boston itself.

J. E. Taylor thought that slang could often be used to the more forciby express some truth. Children could be educated to the use of good language much by the use of good papers and books placed in their hands by judicious parents.

Hon. W. Divine said one essential of enjoyment in home life is to have an abundance of refreshing sleep. People cannot dissipate at night and expect to enjoy life to the full.

Geo. B. Gibbs referred to the cooking question and told an amusing anecdote.

FRIDAY FORENOON.

The weather was delightful and the attendance was good. After singing by the choir the Institute commenced business with Hon. J. P. Shoemaker in the chair.

Geo. W. Miller read an essay on "How to Raise Potatoes." Mr. John E. Taylor read an essay on the

VALUE OF THOROUGHBRED STOCK.

Prof. Beal's lecture on "Plants in Motion" next followed. The pupils of the high school were present, In the afternoon Prof. Beal made a few remarks on the ensilage from the silo of the Agricultural College. Dr. R. C. Kedzie then lectured on "The Ripening of Wheat." Dr. A. J. Stockholm read a paper on the "Medical Treatment of Domestic animals," Mr. John L. Hunter on the "Culture of Indian Corn," Mr. Fred Snyder on "The Farmer's Home."

The closing lecture of this Institute was by President T. C. Abbot on

THE EDUCATIONAL FALLACIES OF THE MIDDLE AGES.

As no manuscript copy of this lecture is furnished for our report we give the following synopsis of it here:

President Abbot spoke of the growth and changes of what constitutes education. For nearly a thousand years a cloud of ignorance, such as we can hardly conceive of, rested upon the world. Some of the kings and clergy could neither read nor write. Previous to this there was a long age of literary and artistic splendor. By and by, after the dark ages, the invention of printing enabled many people to own books. Latin was then the key to all knowledge. Even after the formation of Italian, French, English, German, and other modern languages, Latin was considered the foundation of all education. We no longer think Latin or write books in Latin, with rare exceptions. It is a false and narrow notion of culture to base it on a knowledge of Greek and Latin instead of the sciences, history, French, German, and things which pertain to our government and the welfare of the people. We find culture in a Newton, a Faraday, an Agassiz, although they give most of their time to the study of science. The best models of style are not all written in Greek and Latin. To write English and to speak English we must study and use the English itself. A foreign language is no more necessary for our use of English than was some strange tongue to Demosthenes or Pindar, David or Isaiah. There is a liberalizing tendency and some advantages in some knowledge of some other language than our own. The place to learn English is from the pure wells of English undefiled. Too much time has been devoted in the past to words, and not enough to facts and the thoughts that come from them. To rely on these old authors tends to make a set of readers who take the old books as authority in place of original investigations. Other studies have come to the front, such as physical science, social science, including hygiene, philosophy of education, land ownership, civil service, political science, and agriculture have become prominent. Thought should tally with fact. Discipline is vastly the better which does not affect to talk or to write until there is something to say. An inductive spirit should go along with the study of language. It is much neglected in our schools. A great mistake made by old writers was this: They thought observation was too easy to need rules or much care to secure accuracy. In planning a course of study for our schools there is a waste to be saved, a curiosity to be fostered, not smothered. As late as 1841, at Yale college, in the regular required course, there was no chemistry, no botany, no geology, no anatomy, no physiology, no mineralogy, no meteorology. Times have changed. The sciences have come to the front. Education is no longer considered merely of value in the professions of law, medicine, and theology, but it is a material help to any workmen. There is a prejudice in some minds that nothing is education that does not come out of books. It would be more nearly correct to say that nothing is really educational that comes wholly from books. He spoke of the great value of education to farmers and mechanics to help them in business and in social standing. His strong testimony in favor of a scientific education is all the more valuable as it comes from one who gave all of his early life in pursuit of a classical education.

Before adjourning the following resolutions, presented by James Satterlee, were unanimously adopted:

Resolved, That the thanks of this meeting are due to the professors of the State Agricultural College for their valuable assistance and instruction during this Institute; to the gentlemen who have so kindly favored us with interesting and valuable papers on the different topics; to the choir for the excellent music furnished; to the people and hotel keepers of our city for their hospitality; to the committee of arrangements for conducting the Institute, and to LeRoy Moore for the gratuitous use of his hall during the meeting.

Dr. Kedzie offered a resolution, and put it to the meeting which passed it unanimously, that the thanks of the Institute be tendered Dr. Avery for the able manner in which he presided over the deliberations of the Institute.

LAPEER INSTITUTE.

This Institute was held in the Court House, and was well attended by a highly appreciative and intelligent class of farmers and other citizens.

The following was the programme of exercises:

MONDAY EVENING.

Music.
Opening Address by Henry Lee.
"The Transportation Question"—Prof. R. C. Carpenter.
"Our State Laws in Relation to Agriculture"—Hon. J. B. Moore.

TUESDAY FORENOON SESSION.

Music.
"Fine Wool Husbandry"—W. W. Stickney.
"Roads"—Prof. G. W. Harrower.
"Wheat Culture"—R. M. Moore.

TUESDAY AFTERNOON SESSION.

"Drainage"—Hon. J. T. Rich.
"Ensilage"—Prof. Samuel Johnson.
"Clover"—John Abbott.
"Our School System"—R. L. Taylor.

TUESDAY EVENING SESSION.

Music.
"How to Educate Farmers' Boys"—Wm. B. Hamilton.
"The Department of Agriculture"—Sec. R. G. Baird, Lansing, Mich.
"Improvement of Cattle"—Ira H. Butterfield, Jr.
Committee of Arrangement, Joshua Manwaring, H. D. Rood, Jno. Abbot.

Most of the above programme was carried out, and at the close of a very interesting and profitable institute, the following resolutions were adopted:

Resolved, That the thanks of the people of this county are due and are hereby tendered to the State Board of Agriculture for designating Lapeer as a place for holding a Farmers' Institute, and especially to Professors Carpenter, Harrower, and Johnson, and Secretary Baird, of the State Agricultural College, for their efforts to make it a success.

Resolved, That we heartily endorse the system of holding Farmers' Institutes as a means of diffusing knowledge on the great and important subject of agriculture, and the interest connected therewith in this State, and as being the means of improving the character and intelligence of our citizens.

Resolved, That the interest of agriculture in our county would be advanced by the organization of Farmers' Clubs in the different townships, and to hold frequent meetings and discuss the various subjects appertaining to agriculture.

Resolved, That it is advisable for the citizens of this county to hold an Agricultural Institute annually, similar to the one now being held, for the discussion of the various interests pertaining to agriculture.

Resolved, That we tender our thanks to the officers and committees who have had charge of this institute for the efficient manner in which they have managed the same.

Resolved, That our thanks are due to those of our citizens who have furnished papers for discussion during this institute.

Resolved, That we take home with us and put them into practical use, so far as practicable, the ideas allowed during the discussion here.

MACON INSTITUTE.

This Institute was held in Grange Hall. The weather was excellent and the attendance exceptionally large.

After music and prayer, Hon. Thomas F. Moore gave the opening address. He rejoiced in the fact that Michigan stood so high with regard to its educational institutions. We had one literary school of national reputation, and one Agricultural College where an excellent general and scientific education could be obtained, and whose professors mingle from time to time with the farmers, giving them the benefit of their knowledge. He regarded these institutes as one of the means that were contributing to raise the standard of intelligence among the farmers. He expressed the hope that they might all carry from the institute to their homes ideas that would be refining and elevating, and to their farms ideas that would lead to improved and more remunerative methods of operation.

In response, Miss Collins formally extended a welcome to all those present from other towns and counties, and gave a brief outline of township history. Macon was named from the stream running through the town, which derived its name from an Indian chief who owned a reservation where the Macon empties into the river Raisin. The town was settled in 1830. Of the pioneers of fifty years ago, only two remain, John Sage and Joseph Howell. The population is 1,480. There are six houses of worship within her borders, and 312 school children drawing public money. We have no villages and, we are happy to say, no saloons. When our system of tile and open drainage shall have been completed, Macon will take her position among the richest agricultural towns of the county.

A select piece of music by Miss Josie Clarkson, assissted by others, followed.

The singing at the different sessions of this institute rendered by Messrs. B.

P. Thomas, L. P. Russell and J. P. Talford was exceedingly fine and added greatly to the interest of the meeting.

During the afternoon session Dr. Geo Howell read a paper entitled "The Farmer's Need of Literary Discipline," Prof. R. C. Carpenter gave a lecture on "The Farmer and the Railroad," and Mrs. Rector read an essay on "Rural Life."

The evening session was occupied mainly by the addresses of R. G. Baird, Secretary of the State Board of Agriculture, and Hon. Chas. E. Mickley, Lecturer of the State Grange. The former on the

DEPARTMENT OF AGRICULTURE,

the latter on

SUCCESSFUL FARMING.

On the second day of the Institute, the sessions were during the afternoon and evening.

Mr. G. P. Warren read a paper on

CO-OPERATION.

Dr. R. C. Kedzie gave a lecture on the

RIPENING OF WHEAT.

Mrs. Wilson read an essay on

EDUCATED LABOR.

In the evening Prof. Harrower gave a lecture on

ROADS,

Mr. E. L. Russell a paper on

MISTAKES,

and Mr. Geo. W. Goodrich talked on

MONOPOLIES.

After some appropriate closing remarks by Hon. T. F. Moore, and the usual vote of thanks, the Institute was declared adjourned.

INSTITUTES OF 1883.

The State Board of Agriculture appointed Institutes for January, 1883, to be held at the following places, and appointed the delegations from the College as follows:

Hastings, Barry county, January 9 and 10, attended by Secretary Baird, President Abbot, and Prof. Johnson.

Galesburg, Kalamazoo county, January 11 and 12, attended by Prof. Cook, President Abbot, Dr. R. C. Kedzie, and F. S. Kedzie.

Armada, Macomb county, January 16 and 17. Dr. Kedzie, Prof. MacEwan, Secretary Baird, and F. S. Kedzie.

Farmington, Oakland county, January 18 and 19, attended by Professors R. C. Carpenter, E. J. MacEwan, and W. J. Beal.

Jeddo, St. Clair county, January 23 and 24, attended by Professors W. J. Beal, A. J. Cook, and Geo. H. Harrower.

Trent, Muskegon county, January 25 and 26, attended by Professors Sam'l Johnson, R. C. Carpenter, and Geo. H. Harrower.

The above arrangement was carried out except that the time of holding the Galesburg Institute was changed on account of local considerations, and Prof. Harrower's appointments were filled by Prof. MacEwan, and Prof. Carpenter's by Prof. Johnson and Secretary Baird.

THE HASTINGS INSTITUTE.

The programme of the Hastings Institute was as follows:

TUESDAY EVENING, JANUARY 9.

Address by the President, Mr. Porter Burton.
Lecture—"Farming as an Occupation," R. G. Baird, Secretary of the State Board of Agriculture.
Essay, Mr. Chas. Bauer.

WEDNESDAY FORENOON.

"Rotation of Crops," Mr. Wm. H. Merrick.
"Coöperation Among Farmers," Mr. Ira Slawson.
Essay—"The Management of the Dairy," Mrs. M. R. Granger.
Response, Mrs. J. J. Hendershott.

WEDNESDAY AFTERNOON.

Essay—"The Preparation of the Soil for Cereal Crops," Eugene Davenport.
"Silos and Ensilage," Prof. Samuel Johnson.
"Feeding Stock," J. C. Bray.
"The Cultivation of Flowers," Mrs. Ira Slawson.

WEDNESDAY EVENING.

"Mixed Husbandry," Mr. A. C. Towne.
"Holstein Cattle," Chas. H. Stone.
"The State Agricultural College, its History and Methods," President T. C. Abbot.

President Burton's opening address was timely and well received, and Mrs. Slawson's essay on the cultivation of flowers was listened to with interest and favorably commented on. We have not the manuscript of either of these papers. With regard to the general features of this Institute we give the following from one of the Hastings papers:

The presence of Secretary Baird, President Abbot, and Prof. Johnson added much to the interest of the occasion. Some had thought these professional gentlemen would advocate a theoretical agriculture, which might be of advantage to lunar inhabitants, but certainly would be of no advantage to practical farmers. All were happily disappointed, for their remarks were such as reached the experience and touched the practical side of farming.

The Institute as a whole was a splendid success. The attendance was not as large as a more timely notice would have given, but it was good, and the best of attention to the various essays, papers, and lectures was uniformly given By far the greatest benefits were derived from the discussions which the papers brought forth. These were characterized by a disposition to deal in facts of experience rather than in theoretical moonshine. The officers, particularly President Burton, deserve great credit for the success achieved upon so short notice of this the first Institute. Those upon the programme in the main did excellently, and he must have been a poor observer who did not conclude that Barry county farmers are able, not only to make an attractive programme, but to carry it out as ably as the representatives of any other class or profession. We trust that steps may be taken to organize a permanent Institute society. Such would be of inestimable value to the farmers of Barry county.

ARMADA INSTITUTE.

The programme of the Armada Institute was as follows:

TUESDAY EVENING, JANUARY 16th.

1st—Music.
2d—Prayer by Rev. H. N. Bissell.
3d—Address of welcome by Wm. H. Clark, Jr.
4th—Address by Prof. McEwan of Agricultural College—Subject: "How to Keep the Boys on the Farm."
5th—Address by D. N. Lowell—Subject: "Should the farmers spend more or less time on material interests?"
6th—Music and adjournment.

WEDNESDAY MORNING.

1st—Music.
2d—Address by A. H. Canfield—Subject: "Should the wool grower deal directly with the manufacturer in the sale of wool?"
3d—Address by P. M. Bentley—Subject: "Breeding and Management of Merino Sheep.
4th—Address by E. D. A. True—Subject: "The Farmer his own Mechanic."
8th—Address by S. B. Cannon—Subject: "Farm Drainage."
6th—Music.

WEDNESDAY AFTERNOON.

1st—Music.
2d—Address by Prof. R. C. Kedzie of Agricultural College—Subject: "The Source of Nitrogen in Plants."
3d—Address by Wm. Jenney—Subject: "Best Breeds of Cattle for the Dairy."
4th—Address by Frank Kedzie—Subject: "Sugar from Sorghum."
5th—Music and adjournment.

WEDNESDAY EVENING.

1st—Music.
2d—Address by I. N. Butterfield, Jr.—Subject: "The Millenium of Agriculture."
3d—Address by R. G. Baird, Secretary State Board of Agriculture—Subject: "Farming as an Occupation.
4th—Music and adjournment.

Besides the exercises on the programme a recitation was given by Mrs. Bartlett ("The Old Barn" by B. F. Taylor), in such a manner as to call forth the most enthusiastic applause.

The Hon. Geo. W. Phillips, of Romeo, presided throughout the Institute, and kept everything up to time, and everybody in the most amiable mood. Mr. Wm. H. Clark Jr. gave the following opening address:

MR. CHAIRMAN, LADIES AND GENTLEMEN: The honor accorded to me by the committee of this Institute, to open these exercises, is by me gratefully appreciated. Not on account of any peculiar talent on my part in this line or as to the occupation of farming, but I appreciate it, because with you I am proud of our State, and since I adopted Michigan as my home, I have ever been interested in its agricultural interests, its enterprises and advancement. If I were called upon professionally at this time to give tillers of the soil advice, I would simply suggest in the outset, for each one to try and keep on good terms with his neighbor; each keep up his proper allotment of line fence, see that one's stock does not trespass on his neighbor, and should there be a little friction between you, try and settle all questions of difference amicably; give lawyers as little patronage as possible, but when one's neighbor is found incorrigible or unapproachable by fair methods, then go to some honorable attorney (if such you can find), lay your case fairly before him, and if found in the right, go for the stubborn one until he finds you mean business and will deal fairly with you in the future. But perhaps such advice to the farmers in this vicinity may not be necessary; they perhaps have grown wiser than their predecessors, and possessed of more forgiving natures, and, without a doubt, have at least improved in the science of agriculture.

Allow me, in a brief review, to call your attention to the prosperity of the producing interests in this State, and Macomb county, as to some of its leading products: Statistics from the office of Secretary of State give us the acreage of wheat therein in 1882 to be 1,726,927, yielding 31,777,047 bushels, or 18 and 41-100 bushels per acre; in Macomb county the acreage for the same season was 32,673, yielding 697,568 bushels, or 21 and 35-100 bushels per acre. I regret that I am unable to give you the quantity of corn and oats grown in the State for 1882, but for 1881 the number of bushels of corn was 20,494,568; of oats, 15,352,444. This quantity was largely increased the past season.

The total number of sheep in 1880 was 1,965,952; weight of wool therefrom, 10,724,107 pounds; average weight of fleece, 5 and 45-100. In Macomb county the same year the number of sheep was 65,189; pounds of washed wool therefrom, 358,796; average fleece, 5½ pounds.

I have been unable to obtain the statistics in relation to sheep for 1882, but am informed by a prominent wool grower of this county that the fleeces taken off in Macomb county will average six pounds each, washed wool.

The condition of beef cattle as reported for December, 1882, in Macomb county, is 109 per cent, and that of sheep 108, showing a good condition above average. And now let us not lose sight of our neighbors in the upper peninsula. I had said I would call your attention to some of the producing interests of our State; if, however, I depart from the agricultural branch of this Institute, it will be simply for the purpose of showing you a little of the vast wealth nature has stored up for us and future generations. The value of the output of copper from Keweenaw, Houghton, and Ontonagon counties for 1882 is estimated at $13,418,500, that of iron ore and pig iron mined and manufactured in Marquette, Baraga, and Menominee counties, at $26,000,000.

In the variety of products here raised no State can compare with Michigan, and nature has made it a store-house for various productions of iron, copper, coal, salt, timber, and lumber. More or less of these reach various parts of the world.

Hurrah, then, for the Banner State,
Here seek a home ere 'tis too late,
In Michigan, our Michigan.
Where once were mighty forest trees,
Now grain fields wave before the breeze,
For we can grow just what we please
Right here in lovely Michigan.

Patrons and friends of agriculture, welcome to Armada, and may you find its citizens as generous as the season's bounteous harvest, their hearts as broad as fields of waving grain, and as willing to contribute to your comfort as nature is to develop your stock and fill your granaries.

Several of the persons whose names appear on the programme, among those who were to present papers, failed to perform the task assigned them. The time, however, was fully occupied with the papers presented, and the discussion of them.

FARMINGTON INSTITUTE

Was held January 18 and 19, in the town hall, which was well filled at the hour for commencing the exercises. The exercises were in accordance with the following:

THURSDAY, JANUARY 18.

Music.
Address of Welcome—Hon. P. Dean Warner.
Music.
Dairy Interests Detrimental to the Welfare of the Farmer—O. R. Pettingill, Plymouth.
Negation of above—A. D. Powers, Farmington.
Poem by Mrs. E. P. F. Bradner, Redford.

EVENING SESSION.

Music.
Farm Economy—Prof. Johnson.
Farm Drainage—Hiram Andrews, Orion.
Music.

FRIDAY MORNING SESSION.

Music.
Proper Method of Conducting Agricultural Fairs—D. M. Garner, Davisburg.
Address—W. J. Beal, Professor of Botany and Forestry, State Agricultural College Lansing.
Paper by Mr. Bradner, Redford.

EVENING SESSION.

Music.
Address—Prof. E. J. McEwan, State Agricultural College, Lansing.
Paper by Mrs. C. A. Green, Walled Lake.

The chairman, the Hon. P. Dean Warner, called the meeting to order, and, after music, read his welcome address. He expressed strong hopes of a profitable institute. These gatherings are held in the interest of culture, but principally in the interest of agriculture, including stock-raising, horticulture, and floriculture. We meet here some of the faculty of the Agricultural College, for mutual exchange of views. No doubt both parties will be benefited. The location of this institute is largely due to an application made by A. E. Green in behalf of the Farmington grange.

O. R. Pettingill of Plymouth read an essay on Dairy Interests Detrimental to the Welfare of the Farmer. He objected to a specialty in farming, no matter whether it be dairying, wheat, corn, or any other production. A failuee of one crop from any cause then becomes too disastrous. The implements cost much, the labor is not well distributed over the year. Too large a part of the dairy business is placed in the hands of the buyers, who set their own prices.

A. D. Power showed that he was a man of experience, as he presented a paper in favor of dairying. This business has rapidly advanced. Improved appliances have insured greater profits and made them more certain. Some have said that the dairyman was selling his farm by the quart, but facts show that dairy farms grow better and better, producing more abundant and sweeter grasses and larger crops of all kinds. To succeed one must learn the details of the business, from selecting, raising, and caring for good cows to a knowledge of all the improved machinery. He should like the business, and only engage in it to remain there. He must be up to the times and attend to his business. Like most other departments of farming, dairying will not bear neglect. The dairyman must study the subject as a science as well as an art. Mr. Power gave statistics showing the great magnitude and importance of the dairy interest. The value of butter and cheese is about half that of wheat, the great staple crop of many portions of the north. This takes no account of milk sold and consumed at home.

In the evening Mr. L. L. Dean was called on to give his experience in raising cane. He would select sandy soil, not freshly manured. He prefers Minnesota amber as the best variety. A useless and sickening syrup is produced when fresh manure is used. He has manufactured it for 14 years. This year he made 2,700 gallons of syrup, at a cost of about 35 cents a gallon, saying nothing about the worth of the seed and the leaves. The leaves are worth about as much to the acre as an acre of timothy.

THE JEDDO INSTITUTE.

The Institute at Jeddo, St. Clair county, was held in Grange Hall, January 23 and 24.

The programme of exercises was as follows:

TUESDAY, JANUARY 23.

Music.
Prayer by Elder Barber.
Opening address by David Quaile, Jeddo.
Music.

"Stock Breeding," Ira H. Butterfield.
"Agricultural Experiments," Prof. W. J. Beal.
"Mixed Farming," George Hinkson.

EVENING SESSION.

Music.
"Prevention of the Ravages of the Wire Worm," Geo. Smith.
"Practical Physiology," Prof. A. J. Cook.
Essay—James Anderson.
Essay—Mrs. Dickinson.
Music.

WEDNESDAY MORNING SESSION.

Music.
Prayer by Elder Barber.
"Drainage," Richard Newkirk.
"How shall we keep our Boys on the Farm," Prof. E. J. MacEwan.
"Sheep Husbandry," Lucius Beach.
"Potato Culture," Harry Harrington.
Music.

AFTERNOON SESSION.

Music.
"Can Farmers Handle their own Productions with Profit?" Paschall Lamb, Wm. Ellithorpe.
"Experiments with Insecticides," Prof. A. J. Cook.
Essay—M. F. Carleton.
Music.

The invitation to hold the Institute came from Pomona grange No. 12, of St. Clair county. Owing to the extreme cold the train was an hour and a half late. It was nearly 3 o'clock before the chairman, Moses Locke, called the people in the well filled hall to order. Excellent music was furnished by the young people of the farmers' families. A dozen or more, in connection with the organist, led by William Tool, interested and amused the audience. George McIntyre offered prayer; David Quaile made a short address of welcome.

There was an excellent attendance and a good degree of interest manifested throughout the sessions of this Institute. The exercises were as given in the programme above.

THE TRENT INSTITUTE.

Trent Institute, Muskegon county, was held January 25 and 26. The patrons and others brought with them well filled provision baskets, and having a cook stove and commodious apartments directly below the audience room, they enjoyed a good social time between each session.

Trent is a little hamlet about four miles from Bailey's Station, on the Chicago & West Michigan railroad about thirty-five miles north of Grand Rapids. The building in which the sessions were held is a commodious hall erected and owned by the Grange organization,—a two-story building. On the lower floor is a large dining-room and kitchen, and on the upper floor two ante-rooms and a fine audience-room large enough to seat three or four hundred persons. The severest storm of the winter occurred just before the holding of this Institute. The snow was over two feet deep and the roads somewhat heavy in consequence, still the attendance was large and a good degree of interest pervaded the meetings, which continued to increase till the close. The exercises commenced at 1:30 o'clock on Thursday, January 25, and continued to the next evening.

The programme of exercises was as follows:

THURSDAY, JANUARY 25.

Prayer.
Music.
President's Address.
"The Most Profitable Breeds of Sheep for this Locality,"—J. Herald.
Music.
"The Value of Roots for Stock,"—Geo. A. Miles.
"Ensilage, a Cheap Substitute for Roots,"—Prof. S. Johnson.
"Holstein Cattle,"—Jos. Minnich.
Music.

EVENING SESSION.

Music.
"Best Breeds of Swine,"—O. Whitney.
Lecture by Prof. R. C. Carpenter, Agricultural College.
Music.
"Our Common Schools,"—T. J. G. Bolt.
Question Box.

FRIDAY MORNING SESSION.

Music.
"Most Profitable Grain Crops for this Locality,"—L. F. Seaman.
"Under Draining,"—Wm. Averill.
"Protection for Wool Growers,"—N. Whitney.
Farm Economies," Prof. S. Johnson, Agricultural College.
Music.
"Farmer's Organizations,"—Geo. Bolt.
Question Box.

AFTERNOON SESSION.

Music.
"The True Education for Farmers,"—N. E. Whitney.
Essay—Mrs. Woodard.
Music.
"How to Keep our Boys on the Farm,"—Prof. E. J. MacEwan, Agricultural College.

Mr. Nathan Whitney, who presided over the meeting, in his opening remarks spoke substantially as follows:

Ladies and Gentlemen: The object of this Institute is to bring together science and practice, in lectures and discussions upon subjects relating to our crops, herds, and flocks.

It is the interchange of thought that benefits us in this our chosen calling.

In behalf of the citizens of this vicinity, I welcome you, gentlemen of the Agricultural College, to Muskegon county, to assist us in our first Institute work.

Fellow farmers, as the old year is past and we are entering upon the new, let us endeavor to avoid past errors and strive by forethought and industry to make greater improvements in our work. Let us learn to apply the scientific truths we have come here to learn, and make this meeting a source of lasting good; let us strive to make two blades of grass grow where now but one stands, and we shall be considered public benefactors.

It is this increase of production that has brought the golden stream to our shores, for eighty per cent of our exports come from the farm.

If we each do our part it can not be otherwise than that good shall result from this meeting. And again, gentlemen of the Agricultural College, and citizens of this county, I welcome you, and invite you all to take part in the discussions of the Institute.

THE GALESBURG INSTITUTE.

Galesburg Institute was held February 7 and 8. The constitution of the Husbandman's club of Kalamazoo county provides for an Institute at that time and this organization united with the State Board of Agriculture in making and carrying out the arrangements for a successful meeting. The committee of arrangements had prepared and published the following:

WEDNESDAY, FEBRUARY 7.

Address of Welcome—Wm. A. Blake, Galesburg.
President's address—D. T. Dell, Vicksburg.
Farm Implements and their Care—H. Marhoff, Galesburg.
Discussion and questions and answers.

AFTERNOON SESSION.

National Sugar Bowl—Frank S. Kedzie, Lansing, Ass't Professor of Chemistry, Agricultural College.
Hogs and how to Handle Them— ——— ———.
Discussion and questions and answers.

EVENING SESSION.

Practical Physiology—Prof. A. J. Cook, Lansing, Professor of Entomology, Agricultural College.
Questions and answers and general talk.

THURSDAY MORNING SESSION.

Insecticides—Prof. A. J. Cook, Lansing, Professor of Entomology, Agricultural College.
History of the Agricultural College—Dr. T. C. Abbot, Lansing, President State Agricultural College.
Questions and answers and discussion.

AFTERNOON SESSION.

Business meeting, election of officers.
Source of Nitrogen in Plants—Dr. R. C. Kedzie, Lansing, Professor of Chemistry, State Agricultural College.
The Best Method to Handle Clover—Geo. W. Osborn, Mendon, Mich.
Discussion and questions and answers.

EVENING SESSION.

What Shall we do with our Straw—Geo. L. Sheldon, Climax.
Dairying—Mrs. S, M. Nichols, Kalamazoo.
Discussion and questions and answers.

Mr. William A. Blake, of Galesburg, gave the following address of welcome:

To you, Mr. President, to the officers of your club, to the president and professors of the State Agricultural College, and to all who lend their presence to make up this combined farmers' institute, in behalf of the citizens of Galesburg and the surrounding agriculturists, I say welcome.

It is in no empty formal expression that I make use of this word, but in its most *emphatic* and *broadest* sense.

A retrospective glance over the year takes us back in our mind's eye to the farmers' institute held in this church, under the auspices of the County Husbandman's Club one year ago.

Then the signification of the word welcome was made unmistakably clear by the friendly manner in which our local committees received their many guests, and the excellent and substantial way in which the wives and daughters provided for the requirements of the inner man.

That was a very pleasant and a very useful meeting. It commenced with a very good attendance, and as the sessions progressed the audience and interest increased until we had a packed house of earnest, attentive people, thoroughly enthused with the interests of the meeting. I expect no less favorable results from this meeting.

We are assembling from this and adjacent counties, and from the more remote parts of the State, to counsel together in regard to the all-important interests of agriculture. Interests of such vast importance that the very existence of the human race is dependent upon their successful management.

In contemplating the magnitude of the subject involved, we are led to more fully appreciate the importance of this meeting, including, as it will, educated professional instructors, eminent scientific demonstrators, and those whose minds are stored with useful knowledge, obtained through an earnest, intelligent, and practical experience.

The unsettled questions involved in this subject of agriculture, in a general sense, are almost innumerable. The lines of thought entertained by different individuals in relation thereto are wonderfully at variance.

We see men taking their positions all along the line, from the watchful observer of the moon's phases, by which he is guided in his sowing, in his planting, and in laying his fence blocks, to the scientific chemist who is almost ready to ignore the services of our mother earth, and produce the wheat, the corn, and the vegetables, within his own laboratory.

Our Legislature, seeing the necessity of a more universal and complete knowledge of the principles of agriculture, provided for the establishment of an educational institution especially devoted to the dissemination of such knowledge as would be useful and practical to those engaged in agricultural pursuits.

This institution being established, with its full corps of eminent professors, it was soon discovered that while it was everything that could be desired to the students who could avail themselves of the superior advantages of its teachings, the number of persons reached, in proportion to the great number interested, was too small to satisfy the energetic managers of the institution.

As the people generally could not go to the college and receive the benefits there awaiting them, the professors resolved to take grip-sack in hand and go to the people with their store of useful knowledge. Being impracticable to go from house to house and impart instruction, it became necessary to designate points of delivery in different parts of the State, where the people could assemble and receive instruction. Hence the Farmers' Institute as an auxiliary to the central College for the education of adults.

The Farmers' Institute has done and is doing a good work. Socially it is attractive and entertaining. As affording an opportunity for the interchange of thought in relation to the many important questions continually arising, aided by the able professors from the Agricultural College, it becomes an educational institution of no mean significance.

The Farmers' Institute cultivates friendly social relations. It tends to universalize useful knowledge. It energizes mental action, and is, in fact, an intellectual clearing-house for the comparison and settlement of many differences pertaining to the principles of agriculture.

To you, Mr. President, and to the Farmers' Institute, embodying as it does so many excellences, allow me again to say welcome.

Mrs. S. M. Nichols of Kalamazoo, to whom was assigned the essay on "Dairying," not being present, and the officers of the society not being apprised of the cause of her absence, and fearing a failure of that portion of the programme of the evening's entertainment, the subject was assigned by President Dell to Mr. Lawrence, a prominent farmer, residing near Decatur, Van Buren county, who presented the subject with such suggestions as were deemed of interest and calculated to improve dairying. Mr. Lawrence is a gentleman of pleasant address, and in his impromptu talk did exceedingly well, and created quite a favorable impression here. When Mr. Lawrence had concluded, Mr. Cox, of Portage, and Edwin Flanders, of Comstock, representing their wives, continued the subject, they having devoted much time in the improvement of the dairy. A general discussion then followed, in which Frank S. Kedzie, H. Marhoff, and others participated. The Jersey cow maintained the lead in this discussion, being regarded by the prominent farmers as the best for milk and butter.

"How can I make my husband satisfied with two meals a day?" was announced as the next subject for discussion, Mrs. H. Dale Adams and other ladies participating. The former stated in the course of her remarks that her experience in trying to have two meals a day ended in two meals and two lunches, sometimes three, and asked which was the easiest, "To get two lunches and two meals, or three meals per day?" General discussion followed, resulting in favor of three square meals per day.

The resolutions of thanks tendered to the officers of the institute for the manner in which they had attended to their duties; to the president and professors of the State Agricultural College for their valuable essays and their interest in the welfare of the institute; to the choir for the fine music rendered during the sessions of the institute; to the citizens of Galesburg and vicinity for providing for the entertainment of the guests during the two days' session; to the trustees of the Congregational and Methodist churches for the use of their audience room and basement for the accommodation of the institute; and, finally, to all who in any way contributed to the success of the institute, were read by J. T. Cobb, chairman of the committee, and unanimously agreed to.

The attendance, despite the unfavorable weather, was gratifying and the discussions embraced a number of important topics.

LECTURES AND ESSAYS READ AT FARMERS' INSTITUTES.

PREPARATION OF SOIL FOR CEREAL CROPS.

BY EUGENE DAVENPORT.

[Read at Hastings Institute.]

That a seed may germinate it requires moisture, heat, and air. An excess of the first two will be injurious; of the third not. The degree of moisture and heat necessary for germination varies with different seeds. The variation in the degree of moisture is slight. No cereal will germinate in a soil that is water-soaked, nor in one that is very dry. The range of temperature is considerable through which seeds will germinate, both for the same and for different kinds. Very few will sprout below 40°, or above 120°. Wheat will grow from 41° to 102°, but succeeds best at about 84°. Corn, being a native of a warmer country than most cereals, requires a higher temperature, both for germination and aftergrowth. It will grow from 48° to 115°, but is most certain at 93°. Oats will, I think, grow at a lower temperature than either corn or wheat, but I have nothing but inference on which to base the assertion.

As the seed sprouts and sets up business for itself two more agents must be supplied, viz.: sunlight and a fertile soil in which to grow. Of the five requisites of plant growth, moisture, heat, light, air, and fertility, light and air are never present to an injurious degree. They are as free as water, as active, as essential, and far less harmful. As to fertility, I will say that there might be too much of it, but there seldom is, while extremes of heat and moisture are always injurious. Light acts upon the leaves of plants only, air directly on the leaves and indirectly upon the roots. Moisture, heat, and a fertile soil are concerned in the action of the root.

So far as these agents act upon the plant above the ground they act without our control. The sun will shine upon the leaves and the air surround them in spite of us. They will do as much for the crop of a lazy man as for that of his diligent neighbor. But so far as they act upon the roots of plants so far do they act in proportion to our intelligent exertion. The art and science of agriculture, if you please, is concerned with the best method of securing these conditions in the proper degree. The whole operation of preparation of the soil to this end may be classed under three heads: draining, cultivating, and fertilizing the soil. I will notice briefly how each tends to furnish the already named conditions of plant growth.

The temperature of a soil depends upon the amount of moisture it contains, which, as well as the circulation of air in the soil, depends both upon drainage and cultivation. So far as we control it, the fertility depends upon the proportion existing between the crops we remove and the fertilizers we apply.

DRAINAGE.

An undrained soil is subject to two unfavorable conditions. First, all the water that falls after complete saturation of the soil must needs run off over the surface, and, instead of imparting fertility, dissolves it out and carries it off. Second, evaporation only can reduce the saturated soil to a proper condition of moisture, and the constant evaporation of a large quantity of water from the surface soil destroys its heat, keeping the temperature too low for plant growth for an undue length of time. It is a well known fact in science that any liquid, water especially, in passing to a gaseous form uses up or renders latent a large amount of heat. Translate this, and in the language of practice it would read "A wet soil is always a cold one," An incidental effect of evaporation, too, is the formation of a crust at the surface, and the soil in drying bakes and cracks.

Some idea of this cooling effect of evaporation may be had from the following calculation. I do not pretend to accuracy, as I have not all necessary data, but it is in the main correct and errs, if at all, on the side of small figures and the less startling results. It is a well known fact that water, after heating to 212°, requires 966° additional heat to convert it into steam or vapor whose temperature is also 212°. Arithmetic, by the aid of tables of specific heats and gravities, furnishes the following: Two pounds (about a quart) of water, converted to vapor by evaporation, destroys heat enough to lower the temperature of 1,932 pounds (almost a ton), of water one degree. This would lower four tons of common earth through one degree. Further, the evaporation of seven barrels of water from an acre of ground will destroy heat enough to lower the temperature of the whole acre one degree, and to the depth of one foot. But as much as 50 barrels are sometimes evaporated in a single day. We may call this scientific nonsense, essay farming, or what we please, but there is not one of us but suffers under its truthfulness. A proper draining of the soil, either natural or artificial, must not be overlooked in preparation for cereals. They are very sensitive to wet and cold, and if nothing better, open ditches or furrows should provide means for surplus water to escape. By under-draining it sinks into the soil, giving up the ammonia it has brought down, and filters into the drains nearly pure water. This is not an essay on under-draining, but we all know that when water escapes from below rather than from the surface, the soil is left porus rather than hard and lumpy. Adhesion is a surface action, and such a soil will hold more moisture in a time of drouth, will receive more from the air, and will give more to the roots than will one that is baked and hardened.

CULTIVATION.

The primary object of cultivation is to stir and pulverize the surface of the soil that has been hardened and packed by the rains. The finer the soil the more surface there is to hold moisture and for the action of roots. In a pulverized soil the air circulates freely, decomposing its organic matter and freely depositing moisture in the cool soil as it does upon cooler objects above ground. A well cultivated field will seldom suffer from drouth. Waring says that if corn could be hoed every day it would do well with not a drop of rain during its existence.

FERTILIZERS.

I shall pass the subject of fertilizers hastily, as I wish to allude to it further on under special methods for different cereals. As a general truth the cereals are the exhausting crops, and we should in some manner return the equivalent of what is removed, else we do poor farming. Whatever may be the returns the soil is not a perpetual fountain that will yield unceasingly without replenishing. It is more of a manufactory or a bank that returns us our investment with usury.

The endeavor has been in the preceding not to go beyond the legitimate bounds of the subject. Its discussion naturally includes the objects for which we prepare the soil as well as the preparation itself,—the why as well as the how. It follows yet to speak briefly of the special preparation for each of the common cereals. They will be mentioned and treated as members of a regular rotation, and in the order it seems best to grow them, whatever other crops may intervene.

CORN.

This is pre-eminently a sod ground crop. It is a strong feeder, and delights in a deep, fertile soil. Of all the cereals this is best able to endure and flourish on fresh manure from the yard. It is next to impossible to over-feed it. It ought to meet with no disaster to check its progress; for, like all rapid growers, it does not easily repair damages, and once discouraged is seldom a success.

As a member of a rotation it naturally succeeds the grass crop, which some advise manuring heavily the summer before to stimulate a good growth of roots. Whether this is done or not, this is a crop of the rotation that should be manured. No other crop repays the expense of fertilizing better, or leaves what it does not use in a better condition for its successor.

This sod, which I believe is better to have been manured the summer previous, deeply plowed with a jointer plow, then rolled and well harrowed, makes as good a home for the corn as I ever knew of. Some may object to the rolling, but it is of advantage in pressing the furrows well down, preventing sods from dragging up. It can do no harm, if the soil is dry enough, to work with other tools. Before we entertain any hope of raising corn either to "sell or keep," we must provide means for the surplus water to be carried off; this for reasons before stated. It will be far better if it can be done before the plow touches it, but by all means let it be done sometime, and by underdrains if possible. It must be borne in mind that corn must have a deep soil, finely pulverized, and frequently stirred. It is of a nature that requires a hot air but a moist soil; the latter it cannot have without frequent culture. My subject does not admit a discussion of tools, nor manner of planting, working, or harvesting. As to fall plowing for corn, I have had no experience. It has been advocated to kill the worms, but I am of the opinion that it will hurt the corn far more than it will the worms. Were it not that I have resolved not to say "plaster" to-day, I should say that if it is necessary to plaster corn to get a crop, I believe it a sure sign that the land is in need of available manure; of more food, rather than an additional means of using what little there is. But owing to my resolve I will pass without mentioning it.

OATS.

The next cereal in the rotation is usually oats. They succeed well upon corn stubble plowed either the fall before or in the spring. Fall plowing is undoubtedly good as a means of hastening spring work, and as a means of breaking up heavy soils by the action of frost, provided all is not spoiled by too early harrowing in the spring. But I have small faith in it as a worm medicine. It may give the birds a chance at a few of them, but no able bodied worm possessed of ordinary intelligence is going to lie on top of the ground all winter freezing and warping, when he can be more comfortable by a little digging.

Oats of all crops is poorly planted. It is to be deplored, when all it asks is a fair start. It is charged against oats that their roots grow in clusters, and render the ground lumpy. My little experience does not accord with the charge. Oat ground is oftener dusty than lumpy, and even when hard and lumpy, is due not so much to a bad habit of the oat as to having worked the ground too wet the spring before. Oats will not endure standing water, but are not injured by a brief period of low temperature, and even snow after they are out of the ground. Of course the ground should be drained, then prepared as early as possible, but never work it wet for the sake of sowing early. It will take years to repair the damage done. Light rolling after sowing will hasten the sprouting, then mother nature tends the crop. Properly planted, no crop is so certain in this section as oats.

WHEAT.

It is supposed that the ground is already drained, and that it has received no fertilizers since the crop of corn. If the soil is in a high state of cultivation it will raise a fair crop of wheat as it is, but as we intend to seed with it, it will be best to apply well rotted manure or other fertilizer rich in the nitrates.

Clover of all crops is the best predecessor to wheat, and some advise seeding clover with the oats, cutting a crop of hay the next summer, then turning under the aftergrowth as a green manure for the wheat. I am inclined to think this the cheapest and best fertilizer for wheat. If barn-yard manure is used it should be well rotted, and used as a top dressing. When wheat follows oats immediately the plan has been to plow as soon as possible after removing the oats, allowing the wasted oats to sprout. This is well if it is not plowed again. Let all after culture be at the surface. I believe it is a safe rule never to plow wheat ground but once, even on summer fallow. Wheat does not, like corn, enjoy a deep, loose soil, but rather one that is compact; not baked, but firm. It is seldom too well worked at the surface, but may be too deeply worked. I question if a cultivator, so called, is useful upon wheat ground.

To recapitulate, I think universal experience bears me out in saying that ground for wheat should be ploughed as long as possible before sowing, and only once; that the surface should be kept clean and loose, and nothing more. The old time summer fallow is fast disappearing under our more intensive system. A rotation is found to be more profitable than absolute rest. I omit the other cereals, because they are not in general cultivation, and I know nothing personally of their culture.

If I had aimed in this paper to have written a popular and high-sounding essay, I should have failed with this. I did not consider it advisable to do so, and did not attempt it. If I have mentioned the essential points in preparing the soil for the growth of the grains, with the proper reasons, and this in such a manner as will call out a lively discussion, then I have gained my object. After all, success is easier upon paper than in the field. A writer always farms, on his paper, very scientifically and very successfully. He knows nothing of failures, while out in the field we meet with ten failures to one success. So far as an experiment is concerned, a failure is as important as a success. Let none of us from a feeling of diffidence withhold our failures, for considered from a bread and butter standpoint, the most practical of all, failure or success is a matter of life and death with us.

DISCUSSION.

The discussion on Mr. Davenport's paper had reference chiefly to the amount of heat rendered latent or of which the earth is deprived by the evaporation of water, calling for some additional statements from Mr. D. in elucidating the portions of his paper referring to that.

Secretary Baird stated that it took about seven times as much heat to convert a given quantity of boiling water into steam as it did to bring cold water to the boiling temperature, and this might give us some idea of how much warmer the soil would be from which the surface water was carried off by means of drainage as compared with the soil where the surplus water had to be taken off by evaporation.

ROTATION OF CROPS.

BY WM. H. MERRICK.

[Read at Hastings Institute.]

In speaking on this question I shall probably drift into that of mixed farming as the two subjects are connected together in no small degree. Of course no one can adopt a system of rotation of crops unless his farm is first prepared. When we first clear away the forest it is only necessary to lightly stir the vegetable mould to prepare it for the seed and a bountiful crop is sure to follow, but by continued cropping the virgin soil is soon exhausted and something more becomes necessary in order to keep up the fertility of the soil that a fair return may be had for the labor. It is true that good crops may be raised in succession, if the soil is rich in the plant food adapted to those crops, but sooner or later the failure is sure to come, and the larger the crops the sooner the land will be exhausted.

There has been a great deal of discussion upon the subject of the relation that science holds to agriculture. My own belief is that there is no other occupation that calls to its aid so many of the natural sciences as farming, but how few there are who realize it. I have often noticed than when persons fail to make a living in other occupations that they will in some way procure a piece of land, thinking, no doubt, that anybody can farm it, all that it is necessary for them to do is to plow and sow and Dame Nature will reward them by pouring a bountiful store into their laps, and the result is a failure. Farmers are slow to learn that there is no permanent success without some system of rotation of crops.

There is danger to the farmer who makes a specialty of any one crop. For instance we will take one who devotes his farm to wheat raising. In the first place, continued cropping impoverishes the soil for the reason that he sells the grain off his farm in the raw state and nothing is returned to the land. Then again it is the most expensive crop that a farmer can raise, for if it escape the insect, winter-killing, frost, and drouth, and promises to be a fair crop, in order to harvest it he must pay the highest wages, to the amount of two to three bushels for a day's labor, and then just as he is ready to grasp the fruits of his toil it may slip through his fingers as was the case this last season, occasioned by forces over which he can have no control.

Then again, if he depends entirely upon one crop the price obtained may be so low as to leave no profit over and above the cost of raising the same. Whereas, if he had followed a rotation of crops he would be more independent, having some of each kind to sell, and in a rotation the labor would be more evenly distributed throughout the season, thereby saving the expense of hiring extra help.

I never was much in favor of summer fallowing for wheat. I believe that farmers make a great mistake in doing so much of it. In the first place it is too slow, taking two years to get a crop, which at present prices is certainly unremunerative. Then I do not believe that it is according to the laws of nature to expose the bare soil to the fierce burning heat of a summer sun; I think it better to be shaded by some crop. Let us see how nature works. Take our own beautiful State; the first settlers found its hills and valleys mostly covered by extensive forests. Did you ever think what fertilizers nature used to produce this wonderful growth of forest trees? The answer is that the foliage, acting in a two or three fold capacity, first shading the soil from the burning heat of summer, and in autumn spreading a carpet of leaves to protect the earth from the frosts of winter, and in the end decaying and forming a fertilizer rich in all of the elements of plant food.

Where there were no forests the wild grasses sprang up and grew in luxuriant profusion. Take a cultivated field and turn its soil up to the sunlight and leave it alone and in a few short weeks it will be covered with a mantle of green, showing conclusively that nature is always striving to shade the soil.

The best system of rotation of crops is what is called the five or six years' course, beginning with corn. Take a clover or timothy sod, having allowed the aftermath to fall back on the ground, plow either in the fall or spring. I never could see much benefit in fall plowing, only as it advanced spring work. Above all things let the ground be well fitted, plant to corn, and give it a thorough tillage.

The second course should be oats; but here let me digress from the subject a moment. Every farmer should keep stock enough to consume all of the coarse grains and fodder that he may raise. He should never sell any product of his farm until he has placed the last value possible into it, and that would be in the form of meat or dairy products.

The manure arising from the consumption of the coarse grains and fodder I would haul upon the corn stubble, spreading it evenly, plowing under, and sowing to oats. The third course should be winter wheat, After the oat crop is taken off, the field should be ploughed, and if done aright, will bring to the surface the manure that was applied in the spring, which has become well rotted, and with good cultivation it is thoroughly incorporated with the surface soil, usually making a fine seed bed. For wheat, the upper layer of soil, to the depth of say four inches, should contain the manure especially for that crop. I have noticed that when green, rank, manure was applied in the fall, that it does not become evenly mixed with the soil, causing the wheat to make a rank, uneven growth, liable to rust and lodge badly, thereby proving fatal to a good crop. The fourth course should be a seeding to clover, or a mixture of clover and timothy. Some prefer to sow the timothy with the wheat, and the clover the following spring, before the ground settles. I prefer to sow both in the spring, as timothy sown in the fall is a detriment to the wheat. The spring after the wheat crop comes off, such artificial manures may be applied to the clover as the soil needs. The fifth year the timothy makes a good showing, and this crop is continued for one or more years, according to circumstances, or until the land is wanted to begin another rotation.

In conclusion I would warn farmers against the danger of a system of cropping that takes everything from the soil, giving nothing in return, and any farmer who is guilty of so doing, not only robs and impoverishes his land, but robs his children, by leaving to them an inheritance of worthless, worn out acres, made so by a pernicious system of cropping.

DISCUSSION.

In answer to a question by Secretary Baird, Mr. Merrick said he had a heavy soil and did not often fail to get a catch of grass. When he did fail he had to plow again.

Prof. Johnson referred to the prejudice against sowing wheat after oats in rotation, and asked for a statement on this point from the farmers present. A few did not approve of it, but most of those present sowed wheat after oats in their rotation, with good results.

CORN CULTURE.

BY JOHN M. HUNTER.

[Read at Greenville Institute.]

It seemed passing strange that our worthy friend, our chairman of committee on programme, should select me to write a paper on the culture of Indian corn. We expected to hear all such matter treated both scientifically and practically by our Lansing friends, or at least by our local graduates. I don't think I can tell you of any scientific way of raising corn. If some city chap should ask me for some instruction on corn culture, I could give him plenty. Why, its the easiest thing in the world to raise corn. I should tell him to select a good piece of sod, haul on thirty or forty loads of well rotted manure to the acre, plow it early in May, harrow thoroughly, work in plenty of compost, be sure and have plenty of fertilizers at hand, put a handful of bone dust in the hill at planting, another handful of Mape's special corn manure on just after it comes up, cultivate often and well, and he would have no trouble in growing a good crop of corn. But, as I look around the room, I don't see any city chap, or at least none that wants to learn how to grow corn. Here are mostly farmers, intelligent looking, earnest men, most of whom can raise a better crop of corn than I can. It looks like sending coals to New Castle, so I will not try. But I will tell you how I grow the crop year after year on my own farm. My farm of eighty acres is fenced in eight and ten acre fields, one of which is planted to corn each succeeding spring, always on sod, and the older the sod the better; but in my rotation a sod only gets two years old. I never have any well rotted manure, and as most of us have to use the means and appliances that are at hand, without the aid of expensive fertilizers, I haul out the manure made the previous winter—cleaning out my barnyard and sheds thoroughly—spreading at the rate of about twenty loads to the acre, covering about six acres. About the sixth or eighth of May we commence plowing. I would say here that I like to run my sheep on my corn ground as long as I can, feeding them night and morning. This makes me a little late in planting, which we do a little before the twentieth. The ground is plowed eight inches deep, and well harrowed before marking.

I plant in rows three feet nine inches apart. I have been raising the Smut Nose for a number of years back, but lately have raised the small Yellow Dent. I am not certain which of the two I like the better. On a rich, strong soil, I think the Dent the best; on a lighter soil would prefer the Smut Nose. I do not like the larger growing kinds, as the large stalks make heavy work, and the increase in bushels is mostly in the cob, and corn is what I am after (I never sell corn), so the cob does me no good. We are now ready for planting. If I could have just three stalks to the hill I would like it, so we plant from three to five kernels. As soon as our corn is up we plaster at the rate of 100 pounds per acre. We then commence to cultivate, the first time each way, going once in the row, as I like to break the crust as soon as possible, which, by this time, comes on the surface. We now keep two horses going almost continuously twice in the row each way, crowding closer to the hill as the corn grows large enough to take the dirt. The number of times we may have gone through the corn has nothing to do with my requirement of a well cultivated field of corn. It is cultivate early and often.

By the time clover hay is fit to cut our corn ground is in good shape for the corn to grow. There are always two or three days before harvest in which we manage to run the cultivator through each way, when the corn will take care of itself. I don't want a horse in again at any price.

After harvest I look through my field. Some years I find there is some wild buckwheat, and sorrel, occasionally some pig-weed growing in the hill; such was the case last summer. My twelve-years-old boy and myself, with each a hoe, would take five rows, passing back and forth, cut up, cover, pull up, or let alone, just as was needed, going over the field in a day and a half. When our corn was cut up there was perhaps as many weeds in the field as would grow on two square yards.

Our corn is now ready to cut, which I always do near the ground. I think a good deal of my corn fodder, so try to save it in as good condition as possible. We commence to cut as soon as the corn is well glazed. I always put forty-nine hills in a shock, seven each way, as I think a good sized shock is less liable to blow down than a smaller one. It leaves the stalks in a better condition, having the least amount exposed to the weather. Our corn when in shock stands in rows each way, so that in husking we take two rows along, hauling four shocks to a center, making one pile of corn. We save our seed corn as we husk, selecting those ears that come nearest the type of the kind of corn we are raising, which usually are not the largest ears. We leave a few husks on seed ears, which as early as possible are plaited and hung in the barn. Seed corn treated in this way never refuses to grow.

In conclusion, I find I have told you nothing new. The essentials in raising a good crop of corn are: The ground in good condition, and thorough cultivation early in the season. Some farmers want their corn hoed. I don't think it hurts corn to hoe it, but I think the same amount of labor put on with the cultivator is more economical of time, and does more good. A few words in regard to late cultivation. I find a number of good farmers believe in it. In riding through the country after harvest you frequently see a horse in a corn field, with a man and cultivator behind him. If these men would go into a corn field after a heavy shower, where the soil is washed down the hill side, they would find the ground between the rows completely covered with a perfect network of fine, fibrous, white roots. What are they doing there? Are they looking for a sharp piece of steel to cut and mangle them? I think not. I think they are looking for nourishment and moisture for the plant growing above them.

POTATO CULTURE.

BY G. W. MILLER.

[Read at Greenville Institute.]

Mr. President and Brother Farmers,—I present my essay to you at this time with a good deal of reluctance. I know my inability to do the subject justice. It is a subject that has never received the attention by the farmers that it deserves. But very little, comparatively, has been said and written about this important plant that figures so conspicuously in the welfare of nearly the whole populated world, as well as nearly every individual family. There is no other plant so universally grown among the people, whether rich or poor, as the potato, and yet very few grow it for profit. In order to understand our subject better I will review the history of the potato and its manner of introduction. The potato is a native of our own country, and was probably first found in the mountainous districts of tropical America. It differs but very little in its wild state from our cultivated potatoes, except that it is smaller. The potato was probably cultivated for food by the natives long before the discovery of America by the Europeans.

It was first taken to Europe by the Spaniards in the beginning of the sixteenth century, and about the middle of the same century it was taken to Ireland and England, where it remained to be cultivated only as a garden curiosity, and not as an article of food. In 1623 it was a third time imported from America by Sir Walter Raleigh, who imagined that it might be used with advantage for feeding swine and cattle, and after a while that it might be useful for feeding poor people in time of famine. It was not until the seventeenth century that any measures were adopted to extend its cultivation.

Ireland was the first country to take the lead, the potato having already come into cultivation there to an extent far greater than in any other country, and with great advantage to the people. Other countries saw the manifold benefits that Ireland received from its culture, so that by the middle of the eighteenth century it had become quite important as a field crop, but in some places the people were so prejudiced against it that its cultivation had to be promoted by compulsory regulation. It was not until the beginning of the present century that it became recognized as a good article of food for the human family.

No more important event has ever taken place between the old and new world than the introduction of potatoes into the old world. It has been the means of preventing the once frequent occurrence of famine. So general had its cultivation become, and so dependent were the people upon its resources, that a terrible famine resulted in Ireland from the failure of the potato crop in 1846 and 1847.

The art of cultivating potatoes is so variable, differing with varieties, localities, and in different soils, that it would be impossible to give anything like a general rule for procedure. My experience in potato culture is very limited. It has been confined mostly to one variety and nearly one mode of cultivation. I have not followed raising potatoes on account of any secret that I might have in the matter, nor on account of large yields, for such are not the facts. It has been owing altogether to good prices, accompanied by moderate yields, which returned me more money four-fold than I have been able to make with any other crop.

I frequently hear it remarked by farmers who make wheat their main dependence "There is more money in a potato crop at twenty-five cents per bushel than there is in the best wheat crop," and yet when they plant potatoes they act as though they were afraid they might raise enough for themselves to eat. They plant a row or two around the corn for the horse to destroy in turning around, or a few in one corner of the corn field, forgetting the fact that there is more money in one good acre of potatoes than in three or four of corn. In order to make my assertions good and to show that they will stand the test I will make a few comparisons by comparing the wheat and potato crops for the last ten years preceding 1880.

Wheat, I think, is the staple crop among our farmers. Therefore by comparing the prices per bushel and yields per acre of the potato and wheat crops we can readily see if there is any money in raising potatoes. The lowest average price per bushel for potatoes for any one year during the ten years preceding 1880 was 39 cents, which was in 1875, with an average yield of 110.5 bushels per acre, making the average value per acre $43.10. The lowest average price per bushel for wheat for any one year during the same time was $0.944, which was in 1874, with an average yield of 12.3 bushels per acre, making the average value per acre $11.61. By comparing these values per acre we find a balance in favor of the potato crop of $31.49. The highest average price per bushel for potatoes for the same time in any one year was $0.72, which was in 1870, with an average yield of 86.6 bushels per acre, making the average value per acre $62.35. The highest average price per bushel for wheat for any one year within the same time was $1.258, which was in 1871, with an average yield of 11.5 bushels per acre, making the average value per acre $14.47, showing a balance in favor of the potato crop of $47.88. The average price per bushel for potatoes for the ten years taken together was $0.582, with an average yield per acre of 87.8 bushels, making the average value per acre $51.10. For wheat the average price per bushel for the ten years taken together was $1.06, with an average yield per acre of 12.28 bushels, making the average value per acre $13.02. By comparing these figures we have a balance in favor of the potato crop of $38.08 per acre, or for the ten years taken together we have $380.80, which is a pretty respectable margin in favor of the potato crop upon one acre of ground, provided we allow the same expenses for each crop.

By comparing the amounts of the different potato crops and their prices with the population for the same time, I find the supply varies from 2 1-4 to

3 4-5 bushels for each person, and to bring the price below 60 cents, the crop must approximate very close to 3½ bushels for each person. If we have a population of 50½ millions for 1882, we will have to raise 176,750,000 bushels, in order to make them bring less than 60 cents per bushel. The largest potato crop harvested heretofore I think was in 1879, which gave 181,000,000 bushels, and the price was 44 cents per bushel, making the average value per acre $43.09. In the same year Michigan gave her largest crop, which was 10,994,900 bushels, and sold for 41 cents per bushel, the average yield being 113 bushels per acre, making the value per acre $46.33. In the year 1879 Michigan ranked as the fifth potato State in the Union. Only four others having raised larger amounts, and for quality Michigan stands at the head.

With these few figures I will leave this matter for your consideration, and pass along to the most difficult part of my paper, to wit: How to raise potatoes.

The manner of growing potatoes is so variable that I can do no better than to give my experience. The first and most important part is to select the right variety, and thus far I think my judgment has served me correctly. I plant nothing but Early Rose. For a good quality, early maturity, expense in keeping clean, and in digging, and for one that will always sell for the highest price in the market, the Early Rose has no equal. Since I have been raising them, there have been no less than a dozen different varieties recommended as a superior to the Early Rose, but they have failed to stand the test, and the Early Rose is yet the standard in the market. After selecting a variety to plant, the next question that arises is what kind of ground shall they be planted upon. I prefer a clover sod, one that was mowed or pastured the summer before. As to the merits of such a piece of ground I need not speak. I prefer it without manure, as the potatoes will be smoother, of a better quality, and not so easily affected by disease. I think the best time to plant Early Rose potatoes is about the first of June. The old bugs are then through flying, and by the time the young ones begin to prospect the potatoes will be nearly ripe. I also think that potatoes planted at this time of the season, when the ground is warm and dry, are not so much affected by drouth. I plant in rows three feet apart each way, which is about the right distance to be conveniently worked, and to insure a good yield of a good quality. I plant small potatoes, by dropping one for each hill, and do the covering with a hoe, which I think is the only tool that can be successfully used in covering potatoes. I do not think small potatoes better than large ones, but they are more convenient in dropping, and good for nothing else, so that when potatoes are high, there is quite an item saved in the bill of expense. That small potatoes are good for seed, and do not cause the potato crop to degenerate, I am perfectly satisfied. I have planted small ones for the last seven consecutive years, and instead of my potatoes running out, they are growing better.

I also think that a potato should be planted whole in order to get the best results. It will commence to grow sooner, propagate earlier, and withstand a drouth better.

I find that no more stalks or vines grow from a whole potato than from its half if planted alone.

The work among potatoes should be nearly all done with a horse and shovel plow, which is about the only tool required in tending Early Rose. They require a good deal of earth to be thrown around them in order to keep them covered. I believe they succeed best in being planted upon the top of the ground, as they nearly all grow in a bunch, necessarily causing the ground to move that they may have room. Work among potatoes should be stopped when they begin to blossom, or they will give a second crop of small potatoes. The best tool that I have yet seen for digging potatoes is a spading fork with four flat tines.

In conclusion I must say that I have not had time to give this paper the study that this occasion demands. If, however, I have said enough to induce more farmers to raise potatoes, and to show them that a crop of potatoes, even though a partial failure, is better than a wheat crop, I have done some good.

THE RIPENING OF WHEAT.

BY R. C. KEDZIE.

[Read at Greenville and Macon Institutes.]

The wheat crop of the United States is of great importance, because it is a staple agricultural production in nearly every State and territory of our Union. The grain is also important, because it furnishes the leading article of food for civilized man. Both as consumers and producers Americans are interested in this leading cereal. Any circumstance, therefore, which may affect its production or modify its nature as food, becomes a matter of general interest.

One of the circumstances which has a modifying influence upon the quantity and the quality of wheat is the time of cutting the grain. There is some diversity of opinion respecting the time when wheat should be cut in order to secure the best results, some advocating early cutting, and others recommending that the grain should become dead ripe before harvesting. The plea for complete ripening, like the plea for flinty wheats as a class, is based upon the claim that only the hard and flinty wheats have the desirable amount of gluten; that the early ripened and the soft wheats are so deficient in gluten that good flour cannot be made from them, and only the hard wheats possess the requisite amount of gluten.

The true explanation of this exaltation of the flinty wheats, and the depreciation of the soft wheats, is that there has been a revolution in the methods of milling by the introduction of the patent process. Under the old method of milling when the grinding was completed at one operation, the soft wheats were in demand, and early cutting, while the "berry was in the dough," was recommended. But since the new process has been introduced, in which the grinding is accomplished in successive stages, and the highest prized and priced flour is now made from the middlings, which formerly were discarded as unfit for human food, a very different quality of wheat is desired. The soft wheats are no longer in demand, but the hard and flinty wheats which will produce the largest amount possible of middlings for purifying, making the "new process flour." The farmer is urged to discard his white winter wheat, and to let his wheat stand till dead ripe, in order to secure the hard and flinty berry. This is fair and legitimate, and should give offense to no one, for the miller has the right to give the preference to one quality of wheat berry over another quality; but the case becomes different when he alleges as the ground for such preference that the soft wheat is so deficient in gluten as to be incapable of making good flour, and that the formation of gluten is one of the latest acts in ripening of wheat, and that the early ripened berry is so deficient in gluten as to be unfit for milling. The question, then, becomes one not of physical texture but of nutritive value. The farmer resents the imputation that his grain is deficient in the most important nutritive principle, while the consumer becomes solicitous lest he may be using a flour not up to the standard in nutritive value.

There would have been less heat in this discussion if the miller had frankly said that in consequence of a great change in the process of milling, wheat of a very different texture is now in demand, without attempting to drive out the wheats which had been standards of excellence by representing them so deficient in gluten as to be unfit for his use. The farmer replies: "My white winter wheat had enough gluten five years ago, and commanded the highest price. Why has it become so poor in gluten?" It is hardly fair for the miller to attempt to cover his change of base from white to flinty wheats by this flank movement of asserting that the soft wheats are deficient in gluten.

But if it is true that the hard and flinty wheats alone contain the desirable quantity of gluten, and that gluten is the last principle developed in the process of ripening, it is important for all classes that the facts should be known, because in the long run the truth can wrong no one.

We are told that the wheat of warm climates is richer in gluten and more flinty in texture than wheat of cold climates. Some persons seem to assume that the flinty quality of such wheat is in consequence of its large content of gluten, and that the hardness of any wheat is proportioned to its content of gluten; that since the wheat of this climate becomes more flinty by over-ripening, this change must be attended by an increase of gluten in the last stages of ripening.

The composition of wheat at different periods of growth seemed to me a subject of so much importance that I determined to give it a careful investigation. In such a study it was not my desire to view the subject from the standpoint of either the farmer or the miller. My aim was to establish data rather than to formulate opinions. It seemed to me that for such an investigation the most trustworthy conditions would be furnished by chemical analysis of the wheat at different stages of growth.

SELECTING SPECIMENS.

A field of Clawson wheat, which appeared to be very uniform in its growth and in the quality of its soil, was selected for one set of specimens, and another similar field of Schumacher wheat for a parallel set of specimens. I decided to take two sets of specimens of different varieties of wheat in order to eliminate the influence of individual peculiarities in either variety.

I began to gather my specimens on June 26, 1879, and gathered a specimen of each variety at 9 o'clock A. M. for twenty-one successive days, a period embracing the progressive changes of the berry from its early formation, and before the contents of the berry were milky in color, up to the time of dead ripeness. The Schumacher, however, was found to be somewhat in advance of the Clawson through the whole series, and the berry was in the milk at the first cutting. It seemed to keep about five days in advance of the Clawson.

A small bundle of the grain was cut, labeled, and placed to ripen and dry in an airy room, so as to give the best possible conditions in harvesting, and every bundle was subjected to the same treatment in drying and ripening. When fully dry the grain was beaten out by hand, winnowed, and preserved in glass jars for chemical analysis. The grain thus ripened on the stalk, as it slowly dried in the sheltered room, was different from what it would have been if threshed out as soon as out, but the difference was the same for all, and the grain thus matured would represent the results secured by ripening under the most favorable of harvesting at the several periods of cutting.

CONDITION AT TIME OF CUTTING.

The following diary will give some idea of the condition and development of the berry and the ripening of the stalk at the successive periods of cutting. I also include a brief statement of the condition of the weather, which may assist in explaining the rapid changes which took place at certain stages of growth.

No of Cutting.	Mean Daily Temperature.	Degree of Ripeness of Stalk and Berry of Clawson Wheat at the Several Periods of Cutting	Degree of Ripeness of Stalk and Berry of Schumacher Wheat at the Several Periods of Cutting.
1----	77⅔° Cloudy.	Stalk green; berry watery and immature; a little milky.	Stalks green; berry milky, easily crushed by fingers, sweet.
2----	75° Rain.	Stalk green, and leaves rusted slightly; berry very immature, somewhat milky.	Stalk green; berry easily crushed by fingers, milky and sweet.
3----	62⅓° Rainy.	Berry milky and sweetish; color of berry green.	Berry more milky, but greenish; can be crushed by fingers, sweet.
4----	68°. Cloudy.	Berry milky and sweet; still green in color.	Berry yellowish, milky dough; fingers stained by milk wh'n be'ng cr'shd.
5----	70⅓°. Clear.	Berry milky, sweet, green; no dough.	Straw becoming yellow; berry in milky-dough condition.
6----	72⅔°. Clear.	Straw still green; berry milky, sweet, greenish in color, no dough.	Berry in the dough; crushed between thumb nails stains them.
7----	77⅓°. Cloudy and raining.	Stalks green, but leaves yellow; berry more milky, sweet, yellow-green.	Straw purplish, but leaves green; b'ry in the dough and bec'ming yell'w.
8----	79°. Hot and close, cloudy.	Straw green; heads yellowish; berry yellow-green, thick milk, sweet.	Head brown; berry deep yel'w, stiff dough, can be crnshed by thumb nails.
9----	66⅔°. Cooler and cloudy.	Stalks and heads turning yellow; berry milky-dough, sweet.	Berry brown, hard; difficult to crush between thumb nails.
10----	71½°. Clear.	Stalks and heads yellowish green; berry less sweet and more doughy.	Berry crushes dry; grain harvested to-day.
11----	78°. Rain in night.	Stalks yellowish; heads begin to bend; berry thin dough, a little sweet.	Straw purplish red and fully ripe.
12----	73°. Rainy.	Straw yellow; heads bend more; berry in the dough, only a little sweet.	Heads bend over; stalks becoming brown and leaves dry.
13----	75⅔°. Cloudy.	Heads bend over; berry stiff dough.	Ripe and over ripe.
14----	74°. Clear.	Berry crushes dry between thumb nails; harvested to-day.	
15----	76°. Rain in night.	Berry nearly dry and becoming hard; straw entirely ripe.	
16----	75°. Cloudy.	Berry dry and hard; stalks a full yellow.	
17----	73⅓°. Clear.	Stalks over-ripe; berry shells on handling sheaf.	
18----	79°. Clear.	Stalks becoming brittle.	
19----	81°. Clear.	Stalks becoming brown and brittle.	
20----	85⅓°. Cloudy.	Manifestly dead-ripe.	
21----	78°.	"Still dead."	

The condition of the grain after ripening on the stalk is best exhibited by the specimen of each day's cutting now placed before you.

THE GROSS PRODUCT PER ACRE AT EACH CUTTING.

The amount of grain as influenced by the period of cutting is a question of practical importance to the farmer. In making this estimate I confined my attention to the weight of perfectly dry berry, because I was satisfied that any variation in amount of grain, attendant upon changes during growth, arises from variation in the size and weight of the berry, and not from any change in the number of grains growing on a given area, since new grains would not form during the period of ripening, and all those already formed would pass through the successive stages of development more or less completely. In this way there were eliminated several sources of error incidental to measuring the grain produced on a given area, such as the loss of grain in handling, and from incomplete threshing, varying productiveness of different plots of soil, etc. All broken kernels and foreign substances of every kind were removed, but no grains were removed in consequence of imperfect development. The grain was then poured into the scale-pan of a delicate balance, and ten grammes carefully weighed out and the number of grains of wheat counted. This was repeated ten times for each specimen and one-tenth of the sum of the whole was taken as representing the number of kernels of wheat for the weight of ten grammes.

The gross product of grain at the several stages of growth would be directly as the weight of the kernels, and inversely as the number of kernels required to produce a given weight.

The average number of grains of wheat required to weigh ten grammes at the several periods of cutting is given in the following table. I have also estimated the number of bushels of grain at the different periods of cutting, on the supposition that each variety of wheat produced thirty bushels to the acre as its maximum. The table also contains the percentage of nitrogen, cellulose, and ash, at the different periods of growth:

TABLE I.

Number of Cutting.	Clawson.		Schumacher.		Clawson.			Schumacher.		
	No. grains for 10 grammes.	Bushels to Acre.	No. grains for 10 grammes.	Bushels to Acre.	Nitrogen.	Cellulose.	Ash.	Nitrogen.	Cellulose.	Ash.
1	704	11.23	484	16.11	2.62	4.03	2 72	2.72	3.40	2.20
2	592	13.34	447	17.44	2.36	4.05	2.48	2.73	3.42	2.21
3	531	14.91	455	17.13	2.37	3.55	2.30	2.75	3.31	2.19
4	471	16.81	383	20.37	2.09	3.47	2.24	2.53	2.90	2.18
5	454	17.44	365	23.00	2.04	3.29	2.04	2.51	2.86	2.05
6	362	21.87	332	23.49	1.98	3.16	1.97	2.42	2.88	2.00
7	384	20.62	320	24.37	1.94	3.18	1.96	2.38	2.85	1.97
8	327	24.23	308	25.32	1.96	3.08	1.90	2.45	2.80	1.98
9	316	25.03	304	25.66	1.90	2.80	1.80	2.37	2.83	1.96
10	290	27.31	260	30.00	1.89	2.80	1.81	2.29	2.76	1.94
11	276	28.69	267	29.21	1.96	2.79	1.91	2.41	2.74	1.92
12	282	28.08	260	30.00	2.00	2.40	1.94	2.36	2.68	1.96
13	267	29.66	261	29.88	1.98	2.25	1.91	2.39	2.45	1.91
14	272	29.12	262	29.77	1.92	2.20	1.89	2.39	2.31	1.93
15	264	30.00	266	29.36	1.92	2.26	1.87	2.37	2.26	1.90
16	272	29.12	263	29.65	1.87	2.15	1.82	2.39	2.21	1.86
17	270	29.27	260	30.00	1.97	2.26	1.86	2.36	2.24	1.87
18	277	28.69	260	30.00	1.94	2.36	1.88	2.27	2.29	1.86
19	268	29.55	262	29.36	1.94	2.40	1.27	2.25	2.33	1.85
20	272	29.12	272	28.67	1.94	2.38	1.79	2.22	2.37	1.84
21	268	29.55	276	28.26	1.92	2.39	1.78	2.21	2.36	1.86

It will be seen that the Schumacher is about five days in advance of the Clawson; that the growth of each kind proceeds by a somewhat uneven progression, the increase of growth bearing some relation to the preceding daily temperature, because the specimens were gathered in the morning.

The falling off in the seventh cutting of Clawson is curious, and I can offer no explanation. After the complete ripening of the grain there is a sensible decrease, showing that the common impression among farmers that there is diminished production of grain when harvesting is delayed too long, is well founded. This loss is not from careless handling of the grain or from drying by over-ripening. The loss is a real one, though not large.

CHEMICAL ANALYSIS.

The wheat was powdered by prolonged beating in an iron mortar, and sifting this in a wire sieve of 38 meshes to the inch, and this process repeated till the entire quantity taken had passed through the sieve. The amount of water in each specimen was determined by prolonged heating in the steam bath and cooling in a sulphuric acid desiccator till there was no further loss of weights, and the entire loss of weight was taken as water. The results of all analyses and other estimations are based upon water-free material.

The ash was determined by prolonged burning in a shallow platinum dish, kept at a low red heat till the ash burned white, and the ash was weighed with its natural contents of carbonic acid. The percentage of ash is given in Table I, which shows a regular decline as the grain develops by formation of ash-free carbhydrates.

The cellulose was estimated by boiling in water containing 1¼ per cent sulphuric acid, then with water and repeating process; then with 1¼ per cent caustic potash solution—then boiling with water and washing the crude cellulose with alcohol and ether, following Hennebergh's method. The crude cellulose was then dried in water bath to constant weight; then incinerated and the weight of ash deducted, when the residual weight was taken as cellulose. No estimate was made of the small amount of nitrogen which it contained. The cellulose was of a light brown color.

The percentage of cellulose regularly decreased from the earliest formation of the grain up to the time of ripening, the amount being greater in the first cuttings of Clawson than in those of Schumacher, because of its more immature condition. After ripening there is an increase of cellulose, showing that over-ripening is attended by a loss of nutritive material, if we consider dense cellulose as indigestible. The increase of cellulose seems to be in intimate relation to the process of hardening exhibited in dead ripening.

The nitrogen was determined in the usual way by combustion with soda-lime, and the amount of albuminoids estimated by multiplying the nitrogen by 6.4. The percentage of nitrogen is given in Table I, and the estimated amount of albuminoids in the dry substance is given in Table II.

TABLE II.

No.	Per Cent Gluten. N×6.4=Gluten. Dry.		Water.		Acreage Products; Lbs. Albuminoids.		Acreage Products; Lbs. Carbhydrates.	
	Clawson.	Schumacher.	Clawson.	Schumacher.	Clawson.	Schumacher.	Clawson.	Schumacher.
1....	16.77	17.40	9.81	12.81	113.00	168.19	515.32	544.28
2....	15.10	17.41	10.96	11.97	120.86	182.18	627.27	805.31
3....	15.16	17.60	11.13	12.76	135.62	180.86	707.65	790.41
4....	13.37	16.19	11.32	12.69	134.85	197.87	805.66	962.24
5....	13.05	16.06	11.83	15.44	136.56	221.63	854.07	1,091.61
6....	12.67	15.49	11.26	13.74	166.25	218.63	1,078.64	1,122.00
7....	12.41	15.23	10.85	12.06	153.54	221.78	1,020.37	1,169.95
8....	12.54	15.68	10.46	11.90	180.30	238.21	1,201.10	1,208.37
9....	12.16	15.42	10.83	14.93	182 62	237.40	1,239.20	1,230.46
10....	12.09	14.55	11.66	11.64	198.11	262.90	1,364.95	1,452.50
11....	12.54	15.17	12.41	12.04	215.86	255.87	1,434.63	1,312.79
12....	12.80	15.10	13.53	11.54	215.65	272.79	1,396.03	1,443.33
13....	12.67	15.29	13.50	11.52	225.47	274.02	1,480.10	1,340.62
14....	12.28	15.29	12.62	17.77	214.56	273.11	1,461.18	1,435.30
15....	12.28	15.17	14.51	12.62	221.04	265.72	1,504.66	1,412.60
16....	11.90	15.29	13.53	12.14	209.31	272.00	1,469.10	1,434.60
17....	12.80	15.10	15.54	12.44	224.79	272.80	1,459.01	1,453.22
18....	12.41	14.52	13.71	11.99	213.62	263.72	1,434.79	1,461.58
19...	12.41	14.40	12.58	12.17	220.00	260.15	1,479.07	1,464.61
20....	12.41	14.20	12.85	12.05	216.83	244.27	1,458.51	1,393.51
21....	12.28	14.14	12.40	12.86	217.72	239.76	1,471.35	1,376.30

By Table II. it will be seen that the highest percentage of albuminoids is formed in the earliest stages of growth, and it falls off regularly to the complete ripening of the seed, which contains relatively less albuminoids than at any previous period of growth. The claim that gluten is principally formed near the close of the process of ripening, and that the dead ripe wheat contains more gluten than wheat harvested at some earlier period of growth, receives no support from the results of these analyses.

The hard and flinty berry secured by over-ripening is no richer in gluten than the soft berry secured by early harvesting. I am now speaking of the percentage composition, and claim that a hundred pounds of early ripened wheat will contain a greater number of pounds of albuminoids than will a hundred pounds of the same wheat at a later period of ripening, when the accumulation of starch and other carbhydrates will have lowered the relative amount of albuminoids. But while the albuminoids are centessimally greater at early periods of growth, the acreage product increases with the growth of the crop up to a certain stage of ripening (when the grain crushes dry), and after this period there is no increase either relatively or absolutely. If the dead-ripe wheat is better for the miller than wheat cut at an earlier period, it is in consequence of the physical properties of the flinty berry, and not from any change in the chemical composition or increase of nutritive value.

CARBHYDRATES.

One significant change in the process of ripening was the rapid accumulation of starch. So rapid was the accumulation of the carbhydrates, that while the albuminoids increased in actual amount the increase of carbhydrates was so much more rapid that the percentage of albuminoids fell off continually up to the period of ripening, and when the storing up of starch was completed the ripening of the grain was also complete.

STRAW.

No effort was made to determine the food-value of the straw at the different periods of cutting. The grain so far outranks the straw in money value that the farmer is willing to sacrifice the straw, if thereby he may secure a corresponding increase of value in his grain; but the farmer is well aware of the rapid deterioration of the straw by allowing it to stand till the grain is dead-ripe, and if the dead-ripening is attended by no real increase of value in the grain, but an actual loss in the amount of grain, and the straw deteriorates greatly in the meanwhile, he may conclude that it is best to cut his grain as soon as ripe and thus save himself from needless loss.

In the hope of doing something toward placing agriculture upon a scientific basis, I offer this contribution to the chemistry of the ripening of wheat.

In making this investigation I have enjoyed the hearty and efficient coöperation of R. F. Kedzie, then my assistant in chemistry, and now Professor of Chemistry in the Agricultural and Mechanical College of Mississippi, who made all the analyses and otherwise assisted me in a most satisfactory manner.

SORGHUM SUGAR.

BY F. S. KEDZIE, AGRICULTURAL COLLEGE.

[Read at Galesburg and Armada Institutes.]

The later statistics show the American people to be the greatest sugar consumers of the entire world; the average being fifty pounds per head annually. Of the amount consumed only one-third is produced in this country, the balance being imported, mainly from the West Indies. The amount of money thus expended for foreign sugar is something enormous, and has long ago attracted the attention of political economists to means of increasing the sugar production at home. Attempts have been made to introduce the culture of the sugar beet, and the manufacture of beet sugar in a manner similar to the French and German method. These attempts have uniformly failed to be paying investments, with the single exception of California, on account of the large amount of capital required and the difficulties experienced in raising the beets in sufficient quantity to keep the machinery employed.

Within the past five years the making of sugar from sorghum and green corn stalks has attracted the attention of many skilled and earnest scientific men. Commissioner of Agriculture Le Duc and various State Legislators have given their aid and attention to forward the cause of home-made sugar from sorghum.

Many persons have studied the chemistry of the sorghum cane and its juices from the earliest period of its growth until the cane was dry and the leaves rustled in the late autumn breeze. All kinds of processes known to science and suggested by superstition have been essayed. Patents have been taken out, and mysterious compounds lettered "A" and "B", in distinction from delusive and unknown "X" and "Y", have been freely offered for sale, with the seductive proviso that you have the "exclusive right to use in your township."

Chemical analysis showed the cane (crystallizable) sugar to be there in paying amount, but how to get it out in the crystalline form has been the task which for a long time seemed almost impossible to perform, but the past year and a half has seen the erection and successful operation of two extensive sugar manufactories: The Rio Grande Sugar Works, located near Cape May, N. J., and Champaign Sugar Works, located at Champaign, Illinois.

The Rio Grande Works are located in a country that is so sandy that almost nothing will grow except sorghum. One thousand acres were raised during the past year, and they expect to produce 500,000 pounds of sugar.

In a letter from a person who had visited the works during the working up of the crop, it is stated that the entire cost of the planting and cultivating of the crop is covered by the sale of seed at 65 cents per bushel. The Rio Grande Company intended to plant 2,000 acres the coming season, and probably will do so, but they were met with an obstacle they themselves produced. Seeing the marked success which the company have had, the land owners in the vicinity immediately raised the price of their sand plains, which heretofore they had been only too glad to part with at a very nominal price, and required the company to pay a round sum as a tariff on success.

With perhaps greater success has the Champaign Sugar Manufacturing Company closed their first year of operation. Starting with a capital of $30,000, they raised 250 acres of cane, from which was produced 125,000 pounds of sugar and 22,500 gallons of molasses. The company, after paying all expenses, making an allowance of ten per cent for wear of machinery and buildings, have declared a dividend of eight per cent on the capital, and have $3,000 surplus to pay expenses at the opening of another season. They have also increased the capital stock from $30,000 to $50,000. The process of manufacture in use by the company, and which they have patented is very simple. The cane juice after being crushed is neutralized with lime, heated to boiling, skimmed, allowed to settle slightly, then drawn off into evaporating pans and reduced down to semi-syrup. It is then filtered through animal charcoal to clear it, and boiled to mush sugar in a vacuum pan. The mush sugar is shoveled into iron tanks on wheels, called sugar wagons, and conveyed into the crystallizing room, where it is kept from 24 to 48 hours at the temperature of 70° to allow the formation of good sized sugar crystals. It is finally taken to the centrifugal, where the molasses and sugar finally part company, the sugar left behind being in the state of these samples exhibited. It is now ready for market and readily brings 8 cents per pound at the works.

Besides these two large factories, there are smaller ones in Minnesota and Kansas and elsewhere, scattered throughout the southern, central, and western States.

Like other new enterprises, sugar making from sorghum has many enthusiastic men, who think and essay to prove that the production of sugar from this plant is the enterprise which excels all others in its value and importance. One devotee feeds his family on flap-jacks made from crushed sorghum seed; another beds his cattle with the dried crushed stalks; and still another stuffs his hired man's bed with the material which possibly makes that individual more anxious to be called early in the morning than is usually the case.

The seed is valuable as feed for animals, being but little inferior to corn. Paper can and has been made from the refuse begasse, and is quite remarkable for its toughness.

But we are not here to discuss the question of success of sugar from sorghum as a manufacturing enterprise, but to consider fully and discuss the question: "Can the ordinary farmer, with the means at his disposal, and with the time and experience which he may have, afford to make or try to make sorghum sugar?"

In discussing this question, I take it for granted that by saying ordinary farmer, we mean the farmer who has a certain amount of capital, not large by any means, that he has some help besides his own individual exertions, and that he, like the majority, raises a variety of crops.

Beginning sorghum sugar manufacture without experience, he is almost certain to fail the first year. To produce sorghum sugar steam heat is absolutely essential, for with the slight control which a person can have of an open fire the making of any amount of sugar is impossible. Sugar can be made but not with profit.

He must have then steam heat. After he has got the sugar in the form of mush sugar it must be kept for a day or two in tubs or vats in the crystallizing room, in which the temperature never falls below 70°, and finally the sugar and molasses must be thoroughly separated. At the southern sugar plantations this is frequently done by allowing the molasses to drain away through a coarse sieve, but with sorghum a centrifugal is absolutely essential.

It is apparent then that the essentials for sugar manufacture are steam heat, a warm crystallizing room, a centrifugal, and I may add considerable experience; for I doubt if any person has ever made sugar without paving the way to final success by failures numerous and extensive.

Steam heat is expensive, and one who is about to use it can safely double the figures used by a representative of the steam heating company in calculating the actual outlay for boiler, pipes, valves, etc.

Sugar making then requires three things which most farmers *have not:*

First, Experience;

Second, Steam heat;

Third, A centrifugal.

Being destitute of these essentials, it will not be to his interest or advantage to visit a manufactory to get the experience, and to go to a large outlay for steam and a centrifugal. No; the sorghum sugar industry must, as it appears at present, be left in the hands of capital sufficient to hire skilled labor and nish machinery too expensive to be owned by the farmer alone.

An association of farmers forming a company for the making of sugar would seem the best way in which to bring the farmer and factory nearest together.

A company organized in this way would seem as likely to be successful as any of our cider and apple jelly factories which are spread over the State. Near the college there is now a cider mill, which also works up sorghum brought to it into syrup, and with an increased outlay for boilers, vacuum, pan and centrifugal, could make sugar.

Coöperation must be employed to produce sugar profitably; individual farmers can not accomplish it.

There now seems a new industry opened to the farmer and manufacturer. Analysis of sorghum cane made at the college and elsewhere shows it to contain three-fourths as much crystallizable sugar as the southern cane. It can be grown at one-third less cost, for while the southern cane requires constant cultivation and attention for a year, the sorghum only requires three months. The southern cane has no useful by products like the valuable seed of sorghum.

It is certainly more difficult to extract the crystallizable sugar from the sorghum juice than from southern cane, on account of the numerous foreign materials, such as gum glucose and particles of crushed stalk which exist in large amount in the juice as it comes from the mill. This difficulty has stood in the way for years past. Every one tasted the sugar and recognized its being there, analysis verified it, but being led astray by the analogy of maple sap, thinking it was only necessary to boil it down thick enough, it would then crystallize, we have left one of the most, if not the most, valuable sugar producing plants to waste its sweetness on the desert air. This is not an unheard-of proceeding, for during the first twenty-five years of sugar-cane growing in Louisiana failures were as numerous as successes, and until improved methods of boiling and defecating were introduced, the growing of cane was considered a dangerous financial venture.

But with sorghum the sugar is there, and has been now extracted in large amount in the condition which these excellent samples indicate. It is a pure crystalline sugar, devoid of grassy taste, and of such quality that, used on the table or in the kitchen, is found equal in every respect to the southern sugar. It pays to produce it—let the figures given by the Champaign sugar works and their increase of capital stock, bear witness.

Unlike the southern cane it can be profitably grown in any portion of the Union where corn can be produced. It is not a tender crop; it will stand more frost than corn without injury. It makes the best of forage—fed carefully either in the green state or dried, it is greedily consumed by cattle and horses. In Tennessee farmers fatten their mules and stock on the shoots sent up after the first crop has been removed for sugar.

Sorghum requires very little if any stable manure; it is spoiled for sugar and syrup by a heavy manuring. When grown on land heavily manured both syrup and sugar have a saline taste.

The sugar industry from sorghum is on the road to certain success. Bounties are offered in many States for each ton of cane grown or pound of sugar produced. Michigan is not behind. At the last session, the Legislature passed an act exempting from taxation all property used in the manufacture of sugar for a period of five years from January 1, 1882, and offering a bounty of two dollars for every hundred pounds of sugar made. The President of our State Agricultural Society calls attention to the subject in his annual address, and recommends the offering of a prize for the best samples of sugar exhibited.

Let some of Michigan's farmer capitalists unite to start a sugar factory, and a new industry will reveal itself of which we can now have but a slight idea. The one hundred millions which we annually expend abroad for sugar will be retained at home, and another vexed topic in political economy will be laid in its final resting place, for we shall be able to say we grow our own sugar as we now say we grow our own wheat.

The subject of the profitable production of sugar and syrup from sorghum having been brought to notice, and the legislature considering it of sufficient practical importance to warrant investigation, money was appropriated at the last session, and the work of investigation committed to the Agricultural College.

Two crops of sorghum have been raised and worked up. The first in 1881; the second during the past season. I will discuss first the

CROP OF 1881.

A clear understanding of what has been done can be best conveyed by giving the history of the culture of the crop from its planting until the juice was made into syrup.

LAND AND PREPARATION.

The area of land used was exactly one acre. The soil was a sandy loam of good quality, well drained, and considered as good corn land as the college farm affords. Early in the spring, contrary to orders, the land was manured with ten loads of barn-yard manure. Just before planting it received, according to orders, an additional dressing of thirty bushels of unleached ashes, which was plowed under and thoroughly harrowed.

SEED PLANTING AND CULTIVATION.

The variety of seed selected was the well known Minnesota Amber, which was obtained from D. M. Ferry & Co., of Detroit.

May 19 this was planted in hills four feet apart each way, using ten to fifteen kernels to each hill. The weather was unusually dry, and from this cause or the poor quality of seed a greater part of the acre had to be replanted June 3, by which time a good soaking rain had fallen. The crop was cultivated five times during the summer upon the following dates: June 4, June 15, July 5, July 12, July 15. It was hoed and insufficiently thinned once, June 27. Although the cane was late in starting it made a good growth, and at the time of cutting averged eight feet in height and was of a good stocky appearance.

CUTTING AND STRIPPING.

September 23d, the cane having arrived at maturity as shown by the hardened condition of the seed, the first work of manufacturing the crop was begun. While the cane was still standing, several students, each armed with an ordinary lath, went to work stripping the cane, by a quick downward stroke of the lath by which the leaves were separated from the stalk. This work is the slowest and most tiresome part of the manufacturing process. Following the strippers were the cutters, provided with a common corn cutter, who cut the cane, also removing the head including about six or ten inches of the upper portion of the stalk, and piled the stalks ready for hauling to the crusher.

MACHINERY AND MANUFACTURING.

The machinery used consisted of a No. 3 Victor crusher and a No. 5 Cook's automatic evaporator, mounted in an ordinary brick arch, together with tubs, pails, skimmers, dippers, and a tin cup for visitors to taste from. This last piece of apparatus is essential.

Before going further it may be well to describe how the mill and pan were mounted relative to each other. It was found necessary to mount the mill four feet above the level of the ground, upon posts firmly fixed, in order that the man who fed the mill with cane should not "lose his head" at each revolution of the sweep. The juice coming from the crusher was first received into a tub whose bottom was two feet and a half above the level of the evaporating pan. Running from the bottom of this tub was an iron pipe an inch in diameter provided with a valve which emptied into a second tub standing next to the evaporator, from which the juice was run by an ordinary faucet into the upper end of the pan. Over the mouth of this tube in the first tub was a fine gauze strainer to prevent the tube becoming clogged with pieces of finely crushed cane with which the juice is loaded. The evaporating pan was mounted so that there was a slight incline from the upper end nearest the fire, where the juice was first introduced, toward the lower end farthest from the fire, where the syrup was finally drawn off.

And now to describe the work of manufacture. The juice running in a steady stream from the crusher into the first tub was strained through the gauze, passed down through the tube, and emptied into the second tub. As soon as this second tub was filled the valve was closed connecting the two tubs, and the contents of the second tub were treated with the different chemicals to clarify the juice, such as lime, etc., and after a thorough mixture allowed to run into the evaporator. After the second tub was emptied the connection was opened again with the first tub and the process repeated. In this way the crusher could be run about half the time during evaporation. As the juice in the pan reached the boiling point a green scum would arise, thick or thin according to the kind of clarifying material used, which was constantly removed by skimming. The juice became more dense as it neared the lower end of the pan, so that at the extreme end it became a thin syrup which was then drawn off and returned to the center of the pan to be still further concentrated. Theoretically the juice should have been thick syrup by the time it had reached the lower end, but in actual practice it was found not to be the case. As soon as the syrup became dense enough it was drawn off into tubs and allowed to cool somewhat before it was placed in the barrels for permanent storage.

The question of clarifying the juice is of the greatest importance, for it is at this point in the manufacture that the whole question of good syrup or bad syrup is definitely settled. The peculiar substances which give the grassy taste to sorghum must be cleared away in the boiling juice by the clarifying agent or they will remain to spoil the flavor of the syrup. Part of these materials will be thrown up in the scum by boiling the pure juice without any clarifying mixture, but the greater part will not. On the other hand there is no clarifying mixture now known which will entirely remove these objectionable materials.

One rather remarkable fact is that where no clarifier was used the syrup is lighter colored. This is strange when we consider that the materials which give the green color to the syrup are thrown up in the scum caused by the clarifying material, but it may be accounted for by supposing that the lime added to produce the alkaline reaction, acts also on the coloring matter, changing it from green to brown or almost black, thus darkening the resulting syrup. The question of cost is the question which decides farmers whether the production of sorghum syrup is worth while or not and we will proceed to its discussion at once. First of large items is the crusher and pan. These were obtained from the Blymer Manufacturing Company of Cincinnati.

The price of the crusher was	$135
The pan, which is of copper	160
Arch and irons for same	48
Total expense for machinery	$343

The expense of raising the cane, including rent of land at $5 for the acre, was $12, covering expense of plowing, planting, and cultivating. Expense of working up the crop, including work of stripping, grinding, and boiling, with a man and team to run the mill and haul the canes from the field to mill was $30. Considering that the mill and pan were only run to about one-eighth of their capacity for the season, which was the case, and taking the interest on the capital invested in the mill and pan at the rate of seven per cent, we find the total cost of growing and working up one acre of sorghum to be $45. On this acre were produced 150 gallons of syrup, which, valued at say 50 cents a gallon, amounts to $75. The cost of producing this syrup was in this instance exactly thirty cents per gallon. It is claimed by some that it can be produced for a cost not to exceed twenty-five cents a gallon.

THE CROP OF 1882.

One and a quarter acres planted. The history of the cultivation and manufacture of the sorghum crop of this year is in general a repetition of the preceding narrative. The seed planted was that produced by the previous crop. Side by side with the crop of 1881 was planted an acre of broom-corn, grown with a view to its political importance in the coming fall elections. Its influence was felt, however, at the spring caucus, for when the sorghum plants grown from this seed had got fairly started there were many remarks made about how remarkably it grew, how stocky it was, and how it did shoot up. As the tassels began to form this wonderful growth of stem was explained by a large proportion of the heads showing unmistakable evidence of having felt the baleful influence of broom-corn. In fact about one quarter of the entire acre and a quarter was more broom-corn than sorghum, many of the stalks of this cross reaching to the height of from sixteen to eighteen feet. It was decided not to mingle the two in the process of manufacture, and so far as practicable the stalks showing unmistakable signs of being contaminated with broom-corn were left standing as living testimony to the fact that broom-corn and sorghum cannot be raised in close proximity to each other.

The processes of manufacture employed were very similar to those used in the former year, the principal defecator being lime, although occasionally this was used in conjunction with sulphate of alumina. The best syrup, that is the one of lightest color and of perhaps best flavor, is the one in which bicarbonate of soda was used alone as the clarifying agent.

Much of the syrup was boiled down to such a point that when left to stand for a time in a tub, settled into mush sugar, and was ready for the centrifugal without further evaporation in a vacuum pan. The expenses for this year were as follows:

Planting, rent of land, etc.	$13 25
Working up the crop	47 50
Total expenses	$60 75

Two hundred gallons were made at an average cost of thirty cents and a fraction.

When the experiments in sorghum were commenced it was proposed to first investigate the subject of sorghum syrup and find answers to some such inquiries as these: Can you make sorghum syrup that will not taste grassy? Can an ordinary farmer with the materials which he can usually afford make a good syrup? Can sugar be made in paying quantities by farmers, from sorghum? What is the outlook for growing sorghum—is it going to be a paying industry for farmers to engage in?

In some cases it is best to commence the investigation of a subject with the mind unprejudiced. Whether or not it was an advantage, it was, nevertheless, the fact that when the subject of sorghum culture was first investigated at the college no one connected with the chemical department had ever worked at the manufacture or had witnessed the process.

The result of the experiment, with the figures in regard to cost, which are presented, will show that sorghum syrup can easily be made of fair quality and with good profit by any careful painstaking operator. It can be produced without the grassy taste and with a good color, and, in short, a useful syrup.

Thus far we have not sold any of the molasses, but others in the State say it brings fifty cents per gallon easily, and is in demand at that price. In other parts of the country syrup production is advancing very rapidly. At the cane growers' convention held in St. Louis December 13 and 14, there were present many men from Kansas, Iowa, Illinois, Missouri, and southern States, who had made over a thousand gallons of syrup during the past season.

I have attempted to ascertain the acreage and number of gallons of syrup produced in this State, but on inquiry find that the crop reports made to the secretary of State do not include sorghum in the list of productions reported.

In Kansas in 1881, 45,628 acres were raised, producing 3,899,440 gallons of syrup. In 1882, 68,678 acres were raised, producing 6,181,120 gallons of syrup. From these figures it appears the number of acres planted increased fifty per cent, while the number of gallons increased 58 per cent.

Sorghum syrup is worth on the average forty cents a gallon in Kansas. At this price the crop of 1881 yielded $34 per acre, the crop of 1882 $36 per acre, gross returns. We find also that the average number of gallons per acre in Kansas during the past season was ninety. Comparing this with the producing cost of a gallon of syrup made at the college, and which we find cost thirty cents to produce, we have a net profit of ten cents per gallon, or $9 per acre throughout the entire State of Kansas. There are few crops that can make such a showing on average production and profit.

EXPERIMENTS WITH INSECTICIDES.

BY A. J. COOK.

[Read at Galesburg Institute.]

It is now settled beyond question that the arsenites are the cheapest and most efficient specific against the Codling Moth. Because of their efficiency, they are now quite generally used to destroy the larvæ of the Cabbage Butterfly and the Currant Saw-fly. I find upon inquiry that many use these poisons to protect their cabbages and currants and then use the cabbages and currants without hesitation. The people of California ask if it would be safe for them, in their rainless climate, to use these poisons to protect against the Codling Moth and such insects as the Canker Worms. Many of us have noticed that ten to fifteen days after we have applied London purple or Paris green to the potato vines, especially if mixed with water or plaster, even though there have been no rains, the poisons seem to have lost their power to protect the vines.

The consideration of the above facts led me to the conclusion that it was desirable to make careful experiments to determine definitely, if may be, just the extent of the danger involved in the practices referred to above, that all might be advised of their safety or warned of their danger.

I first experimented to find the amount of the poisons necessary to destroy the insects. I found that potato beetles, currant slugs, and cabbage caterpillars would all be destroyed by use of London purple or Paris green—I have failed to detect that one of these arsenites is superior to the other—mixed with plaster in the proportion of one part in bulk of the poison to 100 parts of the adulterant, and dusted on to the leaves of the plant just so it can be easily seen. I also found that a heaping spoonful of the arsenites—14 grammes or $\frac{1}{2}$ ounce of London purple, or 16 grammes, a little more than $\frac{1}{2}$ ounce, of Paris green—to the gallons of water, when first applied to the foliage, which must be thoroughly wet, was quick death to the insects. I found that even a more dilute mixture—one pound of the arsenites to 100 gallons of water—was effective if forced on with the fountain pump, which throws the liquid with considerable force. We see by the above that it takes very little of the poisons to destroy insect life.

I next sought to determine how long after the poison was applied before it would cease to be effective. In one case, the insects were placed on the plants immediately after the application of the poisonous mixture, and in every case were killed. A brisk shower, even if it occurred immediately after the application, rendered the poison inoperative. In all such cases, the insects ate the foliage without harm. Plants out of doors, entirely sheltered from the rains, were eaten by the insects ten days after the application of the insecticides with but little apparent harm to the eaters. In all the cases that I tried, the insects seemed to suffer no harm from eating the foliage twenty days after the poison was applied. The same might be said with very slight exception for fifteen days. The plants were all sheltered from the rain. I next treated the plants to the poisons and kept them indoors, where no wind could strike them. I then found that the insects were not poisoned as speedily as at first, yet I found that even after twenty days the poison did destroy some of them.

I next sought to find the reason that the insects were not poisoned by eating the foliage fifteen or twenty days after the arsenites were applied. This was not difficult, as an examination with the compound microscope quickly revealed it. Examination of the leaves that had been washed by the rains showed hardly a trace of the poisons. The faintest trace, owing to the decided color, was quickly detected. Leaves that had been freely exposed to the winds showed no green or purple, except in places where the cuticle of the leaves had been destroyed, or where some other depression had formed a lodgment for the poisons. I need say no more to show how slight this amount was than to call attention to the fact of the very slight amount of the poison necessary to destroy the insects, and to the further fact that in this case there was not sufficient to injure the insects at all. The plants that are kept out of the wind, as in close rooms, show much of the poisons even after twenty days. The amount, however, is much less than when first put on. I found that by blowing on the plants, or jarring them, I could remove nearly all of the poisons. I could accomplish the same result readily by sprinkling the plants.

The necessary conclusion, then, is that the poison is all removed by mechanical means. The elaborate analyses by my colleague, Dr. R. C. Kedzie, some years since, showed conclusively that the poisons are not absorbed by the plants.

In conclusion let me say, that these experiments show that far more of these arsenites are used than is necessary. It is always best to use the minimum amount, which, as we have seen is very small. We also see why it is that we often have to make a second application of these poisons to render them fully effective. They further explain why it is that many people eat currants and cabbages after having treated them with these poisons and yet receive no harm. We should certainly advise all to be very cautious in the use of poisons as virulent as are these arsenites. Pyrethrum is safe and effective against the cabbage caterpillars, and so the arsenites should never be used. True, if used on the first brood before the heading had commenced at all, there would be no danger; but if used at all, we may use them after heading has commenced, when the poison may find lodgment and death result. Where such an accident is possible, no risk is excusable. I do not hesitate, however, to say that I consider the use of Paris green or London purple entirely safe on fruit trees where the fruit will not be eaten for four or five weeks after the application. With so good a specific as white hellebore at our command, we should never use these arsenites to fight the currant slug. Here we have to fight the insects at the very time when we wish to use the fruit. Of course, careful rinsing will remove the poison; but suppose the rinsing is not thorough? The possible results should make all hesitate. In case of the codling moth, there can be no possible danger, in our Eastern States, in using these arsenical poisons; and, from the experiments described above, we see that the danger is very slight even in such rainless regions as California. I have no doubt but that the danger of using these poisons will be greater from carelessness in leaving them where stock may eat them or where they will be mixed with the food—and from their color these accidents must occur very rarely—than such use as this last mentioned.

Before closing, let me state that several of our students have tried these experiments and reached the same results that I have reached, as described above.

CLOVER AND HOW TO HANDLE IT.

BY GEORGE W. OSBORN, OF MENDON, MICH.

[Read at Galesburg Institute.]

Mr. President, Ladies and Gentlemen,—About four weeks ago I received a letter from your Secretary, containing an invitation to be present at this meeting, and furnish a paper upon the best way to handle clover.

I suppose the question includes the sowing, raising, and final disposition of the crop so as to receive the most benefit from it; or, in other words, how to make the most money out of it, with the least expense. And I have written out my experience, observation, and thoughts, with this understanding of it.

As sowing the seed is the first thing to be done in raising this important crop, it claims our first consideration. There is a great diversity of opinion upon this point; some sow in the fall, some in February and March, and others in April and May. I have sowed clover at all these different times, and my experience is that the best time is in the spring when all danger of hard freezing is past, and the ground in good condition to be worked, and as evidence of this position, I think all will agree that clover sown in spring with oats or rye is more certain to produce a good stand of clover than if sown at the other times mentioned; but as most of our seeding is done upon ground with winter wheat upon it, I will give you my views of the best way to do it.

First I go diagonally across the drill rows with a harrow, which loosens up the ground more, and is less liable to injure the wheat than by going lengthwise, then I sow the seed and harrow again the way it is drilled.

The amount of seed to be sown is another point upon which farmers differ very much. Some say a bushel to six acres is not too much, others a bushel to eight acres is plenty, while some have good success by sowing a bushel on twelve or fifteen acres. Now the fact is that there are seeds enough in a bushel to thickly seed twenty-five or thirty acres, if it is evenly distributed and all grows. You may think perhaps that this is a mere assertion and a wide stretch of imagination. We will examine the subject and see if we can sustain the position taken.

I find by actual count that there are forty-three thousand and one hundred grains of wheat in one-fourth of a pound, which gives us seven hundred and forty-four thousand grains to the bushel. In an acre of land there are forty-three thousand five hundred and sixty square feet. If we sow one bushel of wheat to the acre, it will make a fraction over one grain to every eight square inches, or a plant on every three inches square. And I find that it takes about twenty-five clover seeds to equal one of wheat in bulk and weight, which gives us eighteen million six hundred thousand seeds to the bushel; therefore, if we sow a bushel of clover seed evenly upon twenty-five acres, we have a plant upon every three inches square, if it all grows, which is thicker than necessary.

The failure to get a good stand of clover is due, in my opinion, to the imperfect manner of planting the seed. It is just as necessary that a clover seed should be placed at the proper depth in the soil to insure its germination and growth, as it is to plant wheat, corn, or any other seeds at the proper depth. How can we expect to get a crop of clover by sowing it upon the frozen ground, leaving it to be beaten and buffeted about by winds and rains, washing it into the hollows, subject to freezing and thawing, sprouting and drying up again, until its vitality is ended?

The surface of the ground upon which clover is sown, should be left level and smooth, because clover is a tender plant when it first comes up, and if the ground is uneven, as it is left by the drill (for instance), the plants upon the ridges will be washed away, and those in the hollows covered up, by the first heavy rain that comes after they are up, thereby destroying them all. One thing of importance in raising clover is to have the ground as free from weeds and sorrel as possible, especially sorrel, which is its worst enemy. It is almost impossible to raise it if sown upon a bed of sorrel roots, but if both start from the seed at the same time the clover will effectually overcome this enemy. The most profitable way I have found to free the ground from weeds and sorrel, is to plant it to corn two or three years in succession; generally two years are sufficient. My remarks so far apply more particularly to soils in which sand predominates. Clay soils are more easily seeded to clover than sandy soils are, because there are generally more lumps, cracks, and crevices, where the seeds find a lodging place, and are not easily disturbed by the elements. Another reason is, the clay is sticky and holds the seeds fast while the germ root is pushing into the soil.

There is another mode of seeding which I consider of the utmost importance to farmers. It is called self-seeding. Who does not believe that if our soils were as completely filled with clover seed as they are with weed seeds, that we would have a good stand of clover every time the land is idle long enough for it to grow? I know of a field upon which a crop of clover seed was plowed under over fifteen years ago, and it has never failed to produce a crop of clover since, when left for that purpose, but the seed has been returned to the soil occasionally when the clover was turned under. This above all others is the way to seed with clover, in my opinion.

I will now consider the disposition of the clover crop, arranging it under three heads, namely: Pasture, hay, and as a fertilizer.

Clover is a good forage plant, and will furnish a large amount of pasturage if used at the proper time, but should not be pastured the first year until in blossom. At this time it has developed a perfect plant, and will stand some hard usage. Stock of all kinds will eat the heads with avidity, and at this time it is the very best pasture for swine that can be obtained. Stock should not be kept upon the clover until it is all eaten up, and the ground left bare, if intended to be plowed for a wheat or corn crop; the stock should be taken off in time for the clover to produce seeds. Let me strongly impress upon your minds the great importance of this point, for if we let the seed go back upon the ground we shall have clover perpetually or until the grasses run it out. We should always plow under the seed with clover, and trust mother earth with it, for she will hold it in reserve until it is brought to the right condition in regard to light, heat and moisture to grow and reproduce itself again.

Thousands of acres of this valuable plant are destroyed every year by being eaten off and trampled into the ground while young, by stock of all kinds. Farmers will turn their stock on it early in the spring, as soon as it looks a little green, destroying the young and tender leaves, which should be left undisturbed for the growth and development of the plant. The leaves at this time are worth very little for feed, and the practice should be abandoned by us all. The leaves are just as essential to the growth of the clover plant as they are to wheat, corn, or trees, and who does not know that it would kill them if the leaves were continually taken off as soon as they appear.

Fall and winter pasturing is another evil which should be guarded against. If clover is pastured late in the fall, especially by sheep, the crown of the plants are eaten out, water gets into the roots, freezes, bursts them open, and they will "heave out" in the winter or die in the spring. I find by experience that the more the ground is packed and beaten down the more liable the clover is to be drawn out by freezing and thawing. Plaster is a good stimulant to the growth of clover, but I consider the addition of ashes makes a better dressing for it than plaster alone, and one or both should always be applied to it when designed for pasture or as a manure crop. But it will sometimes cause too rank a growth for hay.

Clover as a hay crop is of great importance to the farmers, and in my opinion when properly cured and housed without being injured by dews or rains, is the best for all feeding purposes. But it is more difficult to make than timothy, and whole fields of it are frequently materially damaged or entirely lost by rains when the hay is partially or wholly dry. To avoid this risk many farmers put their hay in the mow before it is cured enough, and it heats, mow-burns, is mouldy and dusty, and worth but very little.

The time of cutting clover is an important item in making hay, and I believe as a general rule it is cut too green. I prefer to let it stand until two-thirds of the heads are brown, and even longer if the weather is not good. I cut a few acres at a time in the afternoon so as to not run the risk upon too much at a time, letting lay until the next afternoon and then rake into windrows, and if cured nearly enough put it up in bunches, but if it requires more drying I leave it in the windrow and loosen it up with a fork or turn it over with a horse rake after the dew is off. If dry enough it may be drawn in the afternoon directly from the windrows,but I prefer putting it up in bunches and draw next day, for if it is very dry (as it should be), many of the leaves and heads are broken off and lost, while if it remains in bunches over night it will become damp by sweating and the leaves and heads will not break off in handling. I prefer cutting in the afternoon because if cut in the forenoon it will not get dry enough to put into windrows unless the weather is very fine and the clover is quite thin and light; but the top will generally get dry enough to be blackened and injured by a heavy dew, whereas if cut in the afternoon not much of it will get dry enough to be thus injured, and it will all be wilted and ready to cure very fast the next day. After the hay is taken off the field is pastured or left for seed, but I think it is not a paying business in the long run to raise clover seed for market, but will pay much better to put it back into the ground, and if pastured, never allow it to be eaten off so closely that there is none left for seed.

CLOVER AS A FERTILIZER.

How to improve the soil cheaply, and what will do it, is an important question. In my opinion the cheapest and only practical way is by the use of clover and plaster, especially where we make grain raising the principal business. Barnyard manure is perhaps the best, but it is impossible to get enough of it. I think every farmer will agree with me that a heavy growth of clover plowed under in August, with proper cultivation of the surface, so as to make a mellow seed bed, will uniformly bring a good crop of wheat, and there is nothing equals a heavy clover lay for a corn crop.

It has been found that almost all the elements deposited in the soil by the growth and decay of clover, is contained and held fast in the soil; the most and richest near the surface, but comparatively little being found below six inches. If this position be true, this six inches of soil holds nearly all that is beneficial for succeeding crops. One great law of nature in enriching the soil is to deposit its decaying plants and animals upon the surface, where it is held in readiness for the next growth of plants. No farmer will for a moment question the value of the clover crop as a manurial agent in connection with wheat and corn raising. A ton of dry clover hay, as shown by analysis, contains about forty pounds of nitrogen. Suppose the leaves left upon the field, and the roots, to contain one-half this amount, by turning under a growth of clover equal to one ton of hay per acre, the yield of the wheat crop would be increased eight or ten bushels per acre, provided all nitrogen contained in the clover could be made available to the wheat plants. As an increased growth of clover would be promoted by this timely application of plaster and ashes, the average yield of the wheat crop would be still further increased. Clover, unlike wheat, is not a destroyer, but a large collector of nitrogen, much of which it obtains through its broad leaves from the atmosphere; hence its value as a fertilizer. Every farmer, I think, will agree that clover is a very valuable as well as a manurial agent to enrich the soil, and we sow it with that especial object in view, but in ninety-nine cases of a hundred this object is lost sight of, and the crop is used for some other purpose, and nine-tenths of its cash value is entirely lost. We might as well expect to fertilize a field by drawing a load of manure a few times around it, and then return the load to the barnyard, as to expect to fertilize a field by raising a crop of clover upon it and taking it all off. If we would succeed in fertilizing our nearly exhausted lands, by using clover for that purpose, we should use as much care, and expend as much necessary time and labor to get a heavy crop, as we do to obtain a good crop of wheat or corn. It should neither be pastured nor cut for hay or seed, and everything should be done that is possible to do to get a heavy growth, letting every particle of it remain upon the ground until used for succeeding crops. It will make a heavy mulch upon the ground, protecting it from the burning rays of the sun in summer, and the cold, freezing winds in winter, and prevent a loss by "evaporation" of the manurial elements collected from the atmosphere.

I will relate an incident to illustrate the lasting benefits of an application of dry clover leaves to the soil: About twelve years ago we put a large stack of clover upon a knoll in a field. A large amount of leaves was left upon the ground around the stack. This refuse was scattered about and plowed under and mixed with the soil. That poor knoll has ever since brought the best crop of any portion of the field, not excepting the wheat crop last year, which proves to me the lasting benefits to be derived from clover leaves as manure.

I will now give my mode of preparing a field of clover for wheat: First I plow it not more than five or six inches deep, any time in August, but wait until most of the seeds are ripe enough to grow, if possible, using a jointer upon the plow, following closely after with a light harrow, while the ground is mellow, so as to fill up the spaces between the furrows and level the ground, allowing no stock of any kind upon it. Let it remain in this condition until time to sow, unless it should be necessary to cultivate to keep it perfectly clean. Just before sowing I pulverize and level the surface with harrow and slab-drag which makes it ready for the drill.

I have now perhaps exhausted your patience, and used too much of your valuable time, although I have by no means exhausted the subject, and I will close by saying that I consider clover of the most value to the farmer when handled as a fertilizer; secondly, as a fertilizer and hay crop; and thirdly, as pasturage.

CORN RAISING.

BY E. P. FLANDERS, GALESBURG, MICH.

[Read before the Kalamazoo County Farmers' Institute.]

To the western continent the world is indebted for the greatest blessing it enjoys in the way of a cereal. Maize, or Indian corn, is undoubtedly the most important cereal crop produced on the face of the globe, and its cultivation from being, previous to the discovery of America, confined to the Aboriginal tribes has, as its value became recognized, spread with such rapidity that it is now, and has been for years, an important crop in every civilized country of the world, whose climate will admit of its successful cultivation, and it now constitutes an important factor in the production, either directly or indirectly, of a large proportion of the food of the civilized world.

It not only graces the tables of the affluent, in some of the most dainty dishes, but it is the main article of food in many a pioneer home. The bare recollection of a bowl of rich golden johnny-cake and milk is enough to tempt one to wish to live over again the days of his childhood. Not only does it enter into the composition of much of the food on the pioneer's table, but it fattens nine-tenths of his pork, beef, mutton, and poultry.

Its remarkable capability, by the multiplication of distinct varieties, to adapt itself to circumstances of climate, renders it capable of being successfully grown over a wider geographical range than any other cereal in the world. It can be grown on the American continent from latitude 54° north to 40° south, while in the eastern hemisphere it is grown from the Azores to the southern part of Europe, and over a considerable portion of Asia, and also to a limited extent in some portions of Africa.

The first culture of corn by the North American colonists, of which (with the scanty means at my disposal) I can find any record, was by the James river colonists who, learning its value from the Indians and prompted by necessity, commenced its cultivation in 1608, the year following their arrival at Jamestown. Three years later they had under cultivation thirty acres.

From this small beginning its cultivation has constantly spread until now each season it covers millions of acres of the most fertile land in America, and it overshadows both in acreage and value not only any other cereal, but any other crop of any kind produced on the American continent.

There were raised in the United States in 1880, 62,317,842 acres of corn, the yield of which was 1,717,434,543 bushels, aggregating in value $679,714,499. The value of the wheat crop for the same year was $474,201,880. The value of the cotton crop for the same period was $280,266,242. The value of the oat and hay crops for the same year was respectively $150,243,565 and $371,811,084.

CORN IS KING.

These facts and figures may be interesting but are not necessary in the consideration of the topic of "corn raising," and I propose, during the short time I shall task your patience, simply to give you my conclusions, drawn from experience with the subject under consideration. I am not vain enough to expect, and neither do I desire that all the ideas I shall advance shall escape criticism. On the contrary, I invite criticism of such thoughts as are not indorsed by all those present. Indeed, criticism is necessary, as it draws out different experiences and results. I only ask those disposed to criticise to consider that soils, locations, and surroundings have much to do with results, and in shaping methods. The soil, on which all my experience and most of my observation is based, is a clay loam covered with a rich vegetable mould. It is neither clay nor sand proper, and with good care is loose and mellow. It was originally covered with a heavy growth of beech, maple, rock and red elm, white and blue ash, and basswood, interspersed with whitewood and blackwalnut, and is well sheltered by the same on the east and west.

THE GROUND.

The first requisite for a good crop of corn is a good seed bed. Although there is no crop that will give better returns for careless, slovenly cultivation, there is no crop that will more amply repay good and thorough culture. As to manure, any kind of well rotted barnyard manure is good, that from the hog being the best of all. There is no danger of your getting your ground too rich. There is nothing better for the production of a good crop of corn than a good clover sod, although as good a crop of corn as I ever had anything to do with was planted on a stiff June grass sod, but the early part of the season was very wet and we could not plant until the first days of June. The corn was very small until about the middle of July when the roots began to draw nourishment from the now well rotted sod. During the remainder of the season I never saw corn grow faster, and the first autumn frosts held off very late and gave it a good chance to mature. Commercial fertilizers, phosphates, etc., are no doubt good, but where clover can be grown are altogether too expensive. I have applied plaster on the hill many times, and always with little or no perceptible benefit. I do not, however, say that plaster is a worthless application for corn, for I have many times seen good corn raised on light soils where plaster was applied to the hill. However, for the largest returns from the least labor, a good clover sod excels anything with which I have had any experience. Clover or any other sod for corn should always be plowed with a jointer. Do not strive to be the first in your neighborhood to plant. Although corn should be planted early enough to secure immunity from early autumn frosts, it should not be planted until the ground has been thoroughly warmed by the sun, otherwise it will germinate slowly, while the weeds being much more hardy will get a start that cannot be overcome without much labor.

After the ground has been well harrowed it should be marked and planted as soon as possible, thereby giving the corn an even chance with such weed seeds as may be in the ground. Corn planting, however, should not be hurried at the expense of thoroughness. It should be marked with a four row jointed marker of sufficient weight to make a mark two and one-half or three inches in depth. The rows should be, for the dent varieties, not less than three feet eight inches nor more than four feet apart. If planted at the former distance there should be two, and if at the latter three stalks in a hill. I have never raised corn in drills but I think more could be raised in drills than in hills. It looks reasonable that four stalks one in a place one foot apart would ear better than if crowded in a space four inches square or less. But does the additional yield compensate for the extra labor involved? In clean fields, free from stumps or stones, I think it would.

SEED.

You cannot expect a good crop of corn without good seed. It is impossible to keep any crop up to a high standard of excellence without care in the selection of seed, and corn is no exception to the general rule. Indeed, from the readiness with which the different varieties will hybridize, greater care is necessary in the selection of seed than is required for any other crop. In the production of corn, as in everything else, it should be the aim of the farmer to produce the largest amount of that which is of the greatest value, less of that which is less desirable, and least of that which is of little or no value. The first and grand object of "corn raising" is the grain; the second is the stalks for fodder, while the cob is utterly worthless except for fuel or manure. Therefore it should be the aim of the farmer to produce the smallest amount of stalks and cob compatible with the greatest yield of grain. Hence it follows that seed corn should be saved from medium sized stalks.

When you go into your field to select seed corn, have well fixed in your mind what a model ear of corn should be, and select those ears that most nearly approach that model. The perfect ear of corn is of good length, the kernels are long, and the cob is small. The rows should be straight and uniform, with no short ones. The ear should be well tipped out, and should hold its size well to the tip. Save two or three times more than you want. Spread in a room and dry with heat or hang in open air. I prefer the former method. When about ready to plant, look your seed corn over, and select enough to plant your ground; then look this over again, and select those ears that most nearly approach your ideal of a perfect ear of corn. Shell this by itself, and, if you cannot plant it by itself, plant it across one end of your field from which to save your next year's seed. Practice this method every year and you will soon discard, if you ever held, the old notion that corn planted on the same ground year after year will deteriorate or run out. I have never tried Prof. Beal's plan of cutting away the feeble stalks from the seed plant before the corn is in bloom, but think the idea a good one and worthy of trial. It certainly came from good authority. Always shell off the tips. Perhaps some of my brother farmers present will take exception to this idea. I beg of all who may doubt the wisdom of removing the tips, to try the following experiment the coming season: Take from each of several ears a dozen of the small round kernels at the extreme tip, and then take a dozen well developed kernels from the middle of each ear, and plant in close proximity. You will find in every instance that the plants produced by the tip kernels will be small and feeble, while those plants from the kernels from the body of the ear will be strong and vigorous. The larger the corn the longer the time it will require to mature. You cannot raise so much corn in ninety days as you can in one hundred and twenty days. When you save early corn you do so at the sacrifice of quantity, and *vice versa*. The better way is to follow the golden mean and strive to raise as large corn as you can with the certainty of its maturing every season. As to color, I think it more a matter of fancy than otherwise. I prefer a bright golden yellow, as it looks richer and commands a better price in the market. When you save your seed do not forget to save the finest dozen ears you can find, braid them into a neat truss and take it to your county fair. If, at the close of the fair, you are able to take down the truss honored with the blue card, and a bystander offers you a fancy price for it, do not be afraid to say no. If you fail to get the first premium do not go home angry, but try it again the next season.

As to varieties I am unable to advise. Of course it depends largely on locality and soil. Here in Kalamazoo county, where we can raise the dent varieties to a good degree of perfection, it is folly to cultivate the flint varieties.

CULTIVATION.

While your ground may be rich and mellow, and your seed may be shelled from perfect ears, it is idle to expect a good crop without thorough cultivation. In the early cultivation of corn, on friable soils, the Thomas smoothing harrow is a good implement if used with discretion. On heavy clay soils, which have been packed by rains, it would be worthless.

The Thomas harrow consists of three sections containing eighty-one small round steel teeth slanting backwards, which run right through the hill with little or no injury to the corn, and loosen the ground just where it needs it; whereas a cultivator leaves a square foot or so without stirring. The Thomas harrow is easily drawn by one good horse, and will harrow eight or ten acres both ways in a day. It may be harrowed with benefit the third or fourth day after planting. After the corn is up it should not be harrowed until it is two inches high, as the young plants are exceedingly tender and brittle. After it has attained a height of two or three inches the harrow may be used until it is five or six inches high, unless the ground has been packed by rains, in which case a cultivator should be substituted. A harrow should never be used on corn when the teeth will not scour. The Thomas harrow will extirpate small weeds, but it is worthless to kill June grass or large weeds, and the same may be said of the spring tooth cultivator. After the corn is six inches high a cultivator or double shovel will keep it in good condition the remainder of the season if used often enough. Do not be afraid of injuring your corn by cultivating it after the ears have set.

I am aware that my views on this point will not meet the approval of all, but I am well satisfied that a cultivator or double shovel, used with care, may be run through the corn with benefit once a week until the ears are past the roasting stage. It should at least be cultivated as often as a crust is formed on the surface by rain. I have known many a field of corn well tilled until the commencement of the haying season, and then, owing to the press of work, utterly neglected, because after harvest the owner was afraid to cultivate from fear of injuring it by tilling it after the ears had set, the weeds meantime growing rapidly, and in the fall had attained a height equal to that of the corn, which only yielded half a crop, when a few days' labor at the right time would have paid the owner ten times its cost. After the corn is large, care should be taken not to run the double shovel too near the hill, nor deep enough to break the roots. A single shovel plow should never be allowed in a cornfield.

ENEMIES.

The most formidable enemy of corn in this region is the cut-worm. Fall plowing may be favorable for their destruction, but is not a certain remedy. One old farmer, and a successful one too, once assured me that the worst experience he ever had with the cut-worm was on a piece of ground plowed in the fall. Do not let your sod get too old. A good clover sod is seldom very badly infested with the cut-worm. If the worms are very plentiful delay your planting a few days, and the worms will be passing the larva state. The best way to stop their working is to keep the soil loose by tilling. They go from hill to hill on the surface of the ground, and if it is kept loose and mellow they cannot travel so easily as on a hard crust.

Here let me say a word in favor of that despised and maligned animal, the skunk. He is our best friend, and a great destroyer of worms, bugs, etc. He works for us while we sleep, and will destroy hundreds of cut-worms in a single night. He is worthy of our friendship, and should receive our protection. Our Legislature should pass a law to prevent their wholesale destruction.

I find, by the report of the Commissioner of Agriculture, that the average yield of the corn crop of the United States for 1880, was 27.6 bushels per acre. The average yield in Michigan for the same year, was 40.7 bushels per acre, which yield was equaled by but one other State in the Union. The average yield per acre in Kalamazoo county for 1880 was 39.55 bushels.

This yield can be largely increased by the exercise of judgment in the choice of varieties, and care in the selection of seed, and by the timely use of good tools. An increase of only five bushels per acre on the 37,123 acres raised in Kalamazoo county, would amount, at present prices, to the snug little sum of $111,369. This increase can easily be attained. Now, brother farmers, let us strive to raise each succeeding year a few more bushels of corn per acre. By so doing we shall add materially to our wealth and comfort.

TRUE VALUE OF PURE BRED STOCK.

BY J. E. TAYLOR.

[Read at Greenville Institute.]

My theme embodies an implication that pure breeds possess some other than a true value, as a fictitious value, represented by fancy prices growing out of a sensational panic to possess some wonderful individual of some wonderful breed, or in deceptive prices, where the breeder sells an animal for $1,000, but (confidential) takes $100 in cash, balance in progeny of this wonderful animal at $100 a piece. Such transactions with intent to deceive are illegitimate, and against every sense of honor, are but the deceit of a jockey, and do not recognize value, therefore I recognize but one sort of value in pure breeds, that—true.

This value, however, may arise from a multiplicity of conditions and circumstances, and is either immediate or remote in the realization thereof, and like all things governed by supply and demand, is more or less fluctuating. But I do not propose in this task to preach upon political economy. I therefore deal with pure breeds' value *per se*, regardless of external circumstances. Regarding that true value of pure breeds, is relative, and probably will always remain proportional to other things, about as it is now.

The true value of an animal depends upon points of historical record, anatomical structure, and physiological peculiarity, and out of a careful harmonizing of these three items, under the skillful management of careful men, comes the "force of hereditary transmission," known as "prepotency," but for the existence of which a "pure bred" would be worth no more than a "high grade," perchance less. A good grade steer weighing 1,000 pounds, squarely built and well fattened, has a certain market value; a pure bred, *fac simile* of this steer, has the same market value for beef, the ultimate end of all cattle. Then if the pure bred is but the *fac simile* of the grade, why would he, as a sire, be more valuable than the grade? He has the same anatomical structure, is broad and deep, fine boned, and is pleasing to the touch; he has manifestly the same physiological peculiarities; from a certain amount of a certain kind of food he gains a certain amount per day; just the equal of the grade in every apparent fact and figure; has an historical record running thus: Lord of the Valley (14,837), red, calved August 30, 1856, bred by R. Booth Worlaby; got by Crown Prince (10,087), dam (Red Rose) by Harbinger (10,297) g. d., Medory by Buckingham (3,239), etc. (English Herd-book, Vol. XII, p. 137.)

So has our grade an historical record. It runs thus: Deceiver (287), white, calved August 30, 1856, bred by Tom Careless, Anywhere; got by Crown Prince (10,087), dam Longlegs (50), g. d. Humpback (5,000), by Scaliwag (10), etc. (Some loosely conducted herd-book, Vol. I, p. 10.)

You will observe that the names in the first list indicate animals all of high rank; in the second list all of low rank, and I wish so to be understood. Now it is the experience of men who have most improved our stock, that animals bred in a line with reference to some particular feature, acquire the power of transmitting that feature to their progeny with great certainty. It is also their experience that after years of careful breeding in a line, so that character has become fixed, and the force of hereditary transmission is strong, a single cross will break up all this certainty for time indefinite. As good authority as Joseph Harris, "On the Pig," page 78, reads: "The improved Berkshire boar was used to give size and constitution many years ago to the Essex, and the most eminent breeder of Essex has informed me that on one occasion in a litter of Essex pigs, two little pictures of the Berkshire boar, their remote ancestor by at least 28 years, appeared." This naturally draws out an illustration of the value of an animal as certified to by pedigree.

As a rule common stock has no record of breeding, while pure breeds have such record, and as proof thereof you are usually referred to some herd-book published in the interest of a class of people whom I have found extremely and justly jealous of the attainments of their live stock. Technically, in my opinion, pedigree adds no value to an animal, but is proof of qualities delegated to an animal by a long line of ancestors, possessing more or less uniform characteristics of a given standard. If that uniformity has been invariable and unbroken, we say the pedigree is good, and we may safely expect an animal possessed of such pedigree to transmit the ancestoral type to his progeny; we may even expect this when the particular animal in question is an accidental exception to his family, *i. e.*, he is individually deficient in external characteristics. On the contrary, when pedigree associates ancestors of dissimilar characteristics, we say "pedigree is poor," and if some of those ancestors, though remote, are very inferior, we may expect a pup and a pig in the same litter. This at once suggests the impropriety of expecting great things from an animal, because he brings a written document certifying his sire to have been Lord so and so, and his dam Lady somebody. True it indicates special qualities upon which value depends, and if we investigate and find this pedigree recorded in a herd-book, we have indications of greater value; and when we go farther and study the individuals mentioned in that pedigree and find them all good, we have further indications of value, and so on we may trace back this history to time limited only by the non-existence of further records, constantly adding to or detracting from the probable value of the present animal in question. But the final proof of the true value of the pure bred animal is in the stock which follow him (his descendants), and when a community of farmers have in their midst a male animal which thus proves himself of especial value, no inducement should be allowed to take that animal from them, whether he be "pedigreed" or not.

Several years ago Sheldon Ashley, of Gratton, purchased an ordinary looking Suffolk boar, which was crossed with the common swine of that vicinity for three or four years. I am informed that he sired 1,500 pigs. I am informed not one possessed a colored hair (though from sows of every color), and that there was not one poor pig among them. Any one who saw one of those pigs could tell how the other 1,499 looked.

My father (James Taylor, of Eureka), raised 50 of those pigs from a large black and white sow, and that you may better understand their quality, I present a portrait of the only survivor of the 50 (except one now owned, I believe, by Geo. S. Rosevelt, of Eureka). These pigs, when dressed at 10 to 15 months old, have averaged about 250 pounds a piece, and have invariably sold at 25 cents to 50 cents per hundred weight above the market. Upon this estimate, I conclude that Mr. Ashley's humble pig paid over $2,000 premium upon the porcine interests of this vicinity. Now contrast the success of the half breed animal to which I have just called your attention. He (the son of the above mentioned celebrated pure-bred) is pure white; in general appearance is almost entirely unobjectionable, yet his progeny (from common stock) have been red, black, gray, and white; some have borne a remarkable likeness to a Berkshire, others have very accurately resembled the Duroc, the Chester White, the Poland China, the Essex, and Suffolk. Some have been fat at four weeks of age, and others have been coarse, rangy fellows, and to all appearances will not feed at an earlier age than one year, with any profit, and will then fail to command a premium on market price.

An entire lecture might profitably be devoted to the matter which I have thus far touched upon, but in justice to my theme, other things demand my attention. Anatomical structure is usually defined by external form. Thus an animal which has no surplus of head and heels, is usually small but potent in the stomach, and one that is deep and wide in the brisket, and well rounded in the rib, has a powerful respiratory and circulatory system. For the production of wool the animal presenting the greatest surface exclusive of wrinkles, proportional to gross weight, is best. All animals designed to produce meat are best when they come nearest to filling an oblong box. Animals are best producers of milk when the mammary glands and the veins leading thereto, are apparently of the highest development, and the type of a milker is a truncated four-sided pyramid, reclining upon its side. The animal for labor possesses no peculiar anatomical structure inconsistent with any of the types mentioned, except the light shoulder of the milker, and the extra surface of the wool producer. Now these respective features have a direct bearing upon the true value of pure-breeds, because they are by pure-breeds perpetuated to a greater extent of certainty, than among natives, or the best of grades.

The pure-breeds have originated and developed under systems conducted with special reference to some of the above types, and the genuine breeders of pure-bred stock have never lost sight of their ideal of a good animal for a special purpose. Thus we have swine bred in a line with reference to special points for at least 75 years; merino sheep, 100 years; mutton sheep, 130 years; beef cattle, 125 years; and probably the Jersey may trace her singleness of purpose upwards of 1,000 years. We further observe that what is anatomical perfection in an animal for one purpose, is imperfection for another purpose. At a district fair I once saw judges passing upon the merits of Holsteins, from a Devon standard. Those same men were breeders of fine cattle, and were good judges of a beef animal.

The physiological peculiarities of an animal are of interest to the stock grower in their relations to assimilation, secretion, and reproduction, *i. e.*, the animal that can assimilate the largest amount of food, and make corresponding returns in valuable animal products, is the best, and the degree to which perfection has been attained in these particulars, in an animal not "proved," is measured by anatomical structure, from external appearances. It is by the senses of sight and touch that we predict the life work of a young native or grade animal. In the pure-bred we add ancestral character, or the probable certainty of things characteristic of the breed. Do you say why not apply this to the native stock? I have no objections, provided you can find sufficient desirable features characteristic of them; the only characteristic I know of is a loss upon every one raised. Thus far I have treated of my theme in general in somewhat of a philosophical sense, endeavoring, however, to keep within bounds of those facts which men of experience have proved to be the ground work of success in breeding; but it is figures, dollars and cents, that convince the average farmer. Before attempting such an array of evidence, I wish to remark that there is danger of attributing too much to "blood." It is too often assumed that if we have the right breed we need not be particular about the feed.

While the pure-breeds under proper management yield bountiful returns, with poor management they will speedily degenerate and give unsatisfactory returns. America has few epicureans, our resources are yet so great we are not compelled to concentrate our articles of consumption, beyond a very moderate degree. With most men, so to speak, "meat is meat, and milk is milk," so while I have very decided private views, I will not directly invite discussion upon quality. I believe that the grand principle in stock raising is to produce an animal that meets our demands at the earliest age possible. I have no idea of a breed that can do this under systems of starvation economy. We must learn that it is more profitable to feed 20 bushels of corn in 8 months and receive 200 pounds of fat pork, than it is to feed 20 bushels of corn in 18 months and receive 200 pounds of lean meat. And no one who has ever bred natives, or American breeds of swine, under our local systems of agriculture, and then one of the improved English breeds, will doubt that this expresses the true relations of these breeds. I do not consider that the true value of a pure-breed, as regards the regular farmer, is at all embodied in the preservation of its purity among his general stock, but it lies in the preservation of its purity in the breeding males of his stock. It is almost universally conceded that it is possible to rear a herd of grades, which, for every purpose other than that of breeding from, is equal to, and often superior to, the pure breed.

Departing abruptly from the preceding method of treating of my subject, it is of interest to note that in 1868, according to an estimate made by L. F. Allen, the herdsman's interests in the United States were based upon an annual slaughter of five millions of cattle; in 1880, Hon. T. J. Megibben, in his presidential message before the American Association of Short-horn breeders, estimated the annual slaughter of cattle in the United States at ten millions, worth an average of $40 per head; this represents an increase of 100 per cent in thirteen years. From Mr. Megibben's estimate I will improvise an example, which may crudely represent the present importance of pure-bred cattle. The average price of native cattle in Chicago for 1879 was $1.62 per hundred weight, which was but 46 per cent of the average price of medium grades. Upon the hypothesis that one-half of the cattle slaughtered in the United States will rank as natives, I deduce the following: Forty dollars represents the average price of two animals, one a grade worth 100 per cent, one a native worth 46 per cent; $40, therefore, is the arithmetical mean of 100 per cent and 46 per cent, which is 73 per cent; then 1 per cent equals one-seventy-third of $40, equals $0.5479, and 100 per cent, the value of the grade, equals $54.79, and 46 per cent, the value of the native, equals $25.20.

Much to the injustice of the grades, we must now consider the natives equal in weight to the grades. Upon this base we find one grade worth in Chicago $29.59 more than a native. Chicago live-stock markets very fairly represent the leading markets of the United States, through which probably one-half of all the cattle in the United States are marketed, the other one-half being marketed in villages, where comparatively no distinction of prices is made in different types of animals. Then the true difference in the value of a grade and a native in the United States is approximately the average of nothing and $29.59, equals $14.79. This excess of value upon five millions of cattle amounts to $73,950,000, or nearly $1.50 per capita of population in the United States. Now as regards first cost of grades *vs.* natives, through which we must reach net results: Presuming the five million cattle in either instance to be composed of two, three, four, and five years old stock, we may safely assume the ratio one breeding male to every two hundred cattle. This would imply the previous purchase of 25,000 males, worth say $250,000; estimating the cost of an equal number of natives at one-fourth this amount, or $62,500, we find the first cost of our grades exceeds that of our natives by $187,500; deducting this from $73,950,000, leaves $73,762,500 net excess of value in favor of the grades. While this example must necessarily ignore many items of fact known to exist in the rearing and marketing of our live stock, we can but deduce the general conclusion, that we can no longer afford to produce such stock as has for thirty years in general decorated (?) the pastures of this vicinity.

One more deduction, representing the excess of value of one grade over one native, by $14.79, a sum equal to the interest on $105.63 for two years at 7 per cent; then assuming a native two years old to represent $40 of working capital, the grade must represent $105.63 more, or $145.63 of working capital; or, assuming the grade to be worth $40, then our native is worth $105.63 less, or $65.63 less than nothing.

LINE BREEDING AND THE VALUE OF PEDIGREES.

BY A. F. WOOD.

[Read at Leslie Institute.]

Mr. Chairman, Ladies and Gentlemen: Since greater attention to live stock is the first step in the improvement of farming, we must consider one who does not understand the connection between the cultivation of the ground and breeding, rearing, and feeding the domestic animals, to make but an indifferent figure in rural affairs.

In the breeding of cattle, I believe the Short-horn and their grades superior to all other breeds for a large portion of our State. The improved Short-horn implies the ability to combine the most and best quality of meat and milk on what they consume, and we can obtain such by selecting from families that have been bred long in a line with this in view.

Our improved Short-horns date back about a century, and among the early improvers may be mentioned Westell, Robert and Charles Colling, Mason, and Thomas Booth, and a little later T. Bates, Richard and John Booth, and John Stevenson were prominent breeders. In 1786, George Culley wrote: "This breed, like most others, is better or worse in different districts; not so much, I apprehend, from the good or bad qualities of the land, as from a want of attention in the breeders." The object of the art of breeding is the improvement of animals in those qualities that have a definite value, and while all will not become experts or be equally successful in producing animals of extraordinary merit, a careful study of the principles of the art, which are easily understood, will enable one to make the improvements necessary to his profits.

As milk is one of the definite qualities to be attained in the art of breeding, let us briefly turn the pages of history and glance at some of the records before we touch upon line breeding. Mr. Westell had a cow called "Barforth," that gave 18 quarts each milking; Mr. Houstler's Daisy cow gave 16 quarts; Duchess, by Daisy bull, gave 14 quarts, and each quart, when set up separately and churned, gave 1½ ounces, or 21 ounces to a milking. Brighteyes, owned by R. Colling, gave 15 quarts twice a day. The Princess, bred by John Stevenson, are good milkers; among the Princess' heifers imported in 1849 by Stevens and Sherwood, of New York, was Red Rose 4th. This heifer, when four years old, made 63 pounds of butter in June, and 45 pounds in August, on grass feed alone. S. P. Chapman had cows that made 2½ pounds of butter a day. In 1870, Brighteyes 7th, by Apricot's Gloster (2,500), calved February 6th, and during the last days of November and first days of December made 7 pounds of butter in a week, and that from what she picked in the field. Mr. Somerville's cow, Honeysuckle, recorded in Volume XII, American Herdbook, was fed in the barn, and besides suckling a pair of twin calves, gave a common pail of milk twice a day for quite a time. We have known good milkers of nearly every tribe and family, and the difficulty really is to find Short-horns which will not milk if rationally treated.

What constitutes line breeding, or breeding in a line? It is breeding from similar blood, quality, and form, so as to continue uniformity in the offspring. It may also be expressed as referring to the selection of males of a common type, and belonging to the same family. Thomas Bates was one of the first followers of line breeding, and pursued the same in regard to all the families in his herd. In the breeding of his principal family, the Duchess, from 1804 until his death, or during a period of 45 years, he used very few out crosses. The first was 2d Hubback (1,423) in 1824, an animal bearing very close resemblance to Hubback (319), and having the same foundation as the Stanwick cow. When Mr. Bates procured his next cross, Belvedere (1,706), a Princess, and also tracing back to the same foundation, he told his acquaintances that by the union of the Duchess and Princess blood, he would produce such Short-horns as had never before appeared. This proved true, for by the second cross he got Duke of Northumberland, an animal for which he refused 4,000 guineas. This is more than any one animal had ever sold for up to the time of the New York Mills sale, and even then the highest prices realized were for their descendants. The next crossing was through the Matchem cow, the foundation of the Oxfords, and though having no written pedigrees, it was used with confidence, as it was one of the best animals in the herd of Mr. Brown, and he had been a breeder of Short-horns for half a century. After this he used principally Dukes or Oxfords during his life. When Earl Ducie purchased Duchess 55, he said he would cross her with Usurer (9,763), and improve her shoulders. He did so, but when he saw the calf, said to his friend Strafford: "Bates is right, and I am wrong. I will never cross them again with anything save themselves, viz.: Dukes and Oxfords."

Those families that are bred in a line are those most sought after, on account of the produce being uniformly good. Various examples could be given from the herds of Morris, Thorne, Sheldon, Alexander, and others, that have bred many of the noted families of the Short-horns of the day. The Wildeyes, Barrington, Kirk Leavington, Princess, Rose of Sharon, Peri, Traggs, Bell Bates, Gwynnes, Blooms, and Rosamonds, are among those that have been carefully bred in the hands of many, and are within the reach of the average breeder.

Why the necessity of line breeding in order to obtain sires having the power of prepotency? For illustration: The produce of a strongly bred animal to an inferior one, may be equal to the best, while two such bred together will never produce one equal to either sire or dam. Similar results may be expected from thoroughbred stock bred haphazard, and the animal Fatalist, once owned by the Agricultural College, is a good example. He was bred by Samuel Thorne, and got by 2d Duke of Thorndale, a pure Bates. His dam, Favorite, was by Neptune, a pure Booth, and though she was a superior animal, taking the first prize at the New York State Fair, both as a yearling and as a two-years-old, the produce was not an average animal, nor one that ever made a mark of excellence in his offspring. As an opposite example, or for similarity in offspring, take the cow Souvenir 2d, by imported Earl of Clarence (14,167), and having, through her dam and grand-dam, five crosses of the Bates bull, Apricot's Gloster (2,500), and a strong infusion of similar blood before, she has produced three calves from Brighteyes Gloster, that are about all alike.

Those that follow line breeding, especially those that do not have a good chance to obtain sires, often have to resort to close or in-and-in breeding. As far as we know, all the great breeders have practiced it to a greater or less extent, with the same purpose—that of retaining and fixing certain desirable characteristics in the herd, using it as a means of improvement, and not as an end desirable in itself.

I have confined myself in this paper to Short-horn cattle, because of them a public record has been kept the longest, and we can learn more of the practical results of careful breeding, but the same principle carried out will produce in the milk breeds the best cow for that purpose alone. The same can be said of the beef-breeds; also of the horse for the road, for all work, or for draft; of the sheep for wool, or for wool and mutton; and the same of other classes of animals. And as I leave this subject, I will now come to the value of pedigrees.

The value of any pedigree will depend upon its authenticity and completeness; not depending so much on its length as upon how long the top crosses have been in line without the infusion of inferior blood. It is the pedigree that makes an animal worth more than he would be for beef and milk, and by understanding the breeding, we may know how to couple together so as to get the best results.

In 1875 Joseph Hopkins raised a superior calf, and sold it with a spurious pedigree to Mr. Allsopp for 115 guineas. Mr. A. raised 58 calves, most of them inferior in quality, and some with black faces; the general character was so tainted and botched that an investigation was made, and the case carried to the courts, where he obtained judgment for damages to the amount of 750 pounds. This is a clear case of a good individual animal without any noted ancestry to fall back upon.

Duchess 51st was bought at Bates' estate sale in 1850, by S. E. Bolden, and after arriving home, and in comparing her with other Short-horns on his farm, he became so convinced of the superiority of the Bates blood that he determined to make his stand on it. He went and re-purchased of Mr. Hay Grand Duke (10,284), and from this pair he laid the foundation of the Grand Dukes and Duchesses, becoming one of the most noted breeders of sires, and selling for the highest prices of any one in his day in England. Why is a well bred Duchess, young and all right, worth from five to ten thousand dollars? Because they have been bred so long and strong in a line with judgment that they improve other Short-horns, and the demand for strong bred sires is greater than the supply. The male practically represents one-half of the herd, hence the necessity of looking upon an animal on paper as well as individually.

In the onward march of progression there is no place for a backward step; we must work with a purpose, and as breeders, use double caution in the selection of our breeding animals. To obtain greater uniformity, the head of the herd should be bred stronger than the females, and each successive sire stronger in line than its predecessor. No more can we breed good animals without patience, and determination to have each generation better than the preceding, than we can expect to make plants thrive when transplanted from rich to poor soil.

And now, brother farmers, let us look well to line breeding and the value of pedigrees in our own herds, and see if we can not add value to our live stock, and thus, in one way, confer a blessing on our fellow men.

MEDICAL TREATMENT OF DOMESTIC ANIMALS

BY A. J. STOCKHOLM.

[Read at Greenville Institute.]

Mr. President, Ladies and Gentlemen: When the committee appointed to prepare a programme for this occasion made the request that I write an article to be read at this meeting, on the Medical Treatment of Domestic Animals, I declined to do so, on the ground of incompetency, believing in my own mind that I was not qualified to deal with a question of so much importance to the public generally, and farmers in particular, in a satisfactory manner. But after a good deal of hesitation, I reluctantly yielded to the importunities of friends and this committee, and consented; aware, as I am, that a subject of this kind necessarily calls out a vast amount of criticism, many different opinions existing in regard to the proper medical treatment of domestic animals; not only of the quadruped, but of the biped species as well. Do you, Mr. President, versed as you are in medical lore, schooled in the principles of scientific medical practice; a practicing physician in this vicinity for the last 30 or 40 years; do you doubt me when I say that when commencing to write on a subject like this, one of so much importance to the farmer, and others as well, I feel as if I were standing on the very summit of a volcano, that I knew not how soon might burst beneath my feet? I see before me, scattered throughout this large congregation of people, men of science, professors of colleges and schools, doctors of divinity, doctors of physic, and of the law, and it would be hard to say how many of veterinary proclivities. Ladies and gentlemen, I am a farmer, and I write as a farmer, to farmers. I make no pretence of being a scientist, having never graduated in any school of veterinary practice. If, in my researches after truth, and the true method of the medical treatment of animals, I have gleaned from the experience and scientific research of others, valuable information, I do not claim to be the inventor or discoverer, but base my practice on the experiments and experience of others, together with my own experience.

The one great essential point in the treatment of domestic animals is to keep the animal well when it is well. Perhaps you will say, What has that to do with the medical treatment of animals; when the animal is well it needs no physician? Being somewhat of a Yankee, I will answer this question by asking one of you: How many are there in this congregation of people who own horses or other animals, that do not keep a bunch of condition powders, or bottle of nitre, or nitre and buchu, constantly on hand in the stable, or somewhere near, so that it can be got at very readily, and must needs give the horse or other animal an occasional dose, say twice or three times a week, "for he's a little off, you know?" Now how many are there present that don't practice this very thing? If any, please make it manifest. This remark, "he's a little off, you know," was made to me a few years ago by a farmer, while I was helping my brother in his store for a short time. We kept condition powders for sale.

This farmer came into the store one day and accosted me something like this: Aaron, they tell me you are quite a horse doctor; I want some condition powders; Which are the best? There were several kinds on the shelf, done up in an attractive manner, most of which had the picture of a poor, broken down looking horse on one corner, and on the other corner, one with his head elevated, neck arched, nostrils expanded, etc. The one was the horse before taking, and the other, the horse after taking. I told him I didn't know which were the best, as I never used them.

I then asked him if his horse was sick, and the answer was: "Oh, no; but a little off, you know, and I want some condition powders to bring him around, you know." I sold him the powders, and then advised him not to use them if his horse was not sick; and told him I thought the most his animal needed was exercise, and a little dieting. To take the grain away from him for a few days, lessen his feed, give him bran mash, and let him get hungry; for he was a good feeder, and liked to see his horses sleek and fat. Some three months after, he called me to see his horse. There was no doubt about the sickness this time. I found the animal suffering from indigestion, constipation of the bowels, urinary difficulties, anasarcial swellings of the legs and other parts of the body. A state of things evidently, to me, due in a great measure to the indiscreet use of powerful medical remedies.

I believe, ladies and gentlemen, there exists a natural law to guide us in the administration of medicines to all animated beings; and that law is this: Like cures like. If the hair off the dog will not cure the bite, the hair off from a similar dog will, if you please. That is, a remedy will cure symptoms when they arise from some other cause, similar to those which it will itself produce, if taken during health. And my practice in the medical treatment of animals has been based upon this principle for the last ten years. Whether successful or not, I will leave for my patrons to say. I have never solicited patronage, but rather avoided it; but I believe, ladies and gentlemen, this to be the true principle on which to base our practice in the medical treatment of animals: "Like cures like;" and I think science demonstrates this, which I shall endeavor to show before I leave the subject.

It is very essential then, that medicine administered on this principle should be given in very small, or minute doses, for if given in material doses it would most certainly aggravate the symptoms; but in small doses it simply excites a reaction, which overcomes the diseased action. Experience has taught me this, for sometimes in my eagerness and haste to effect cures, I have overdone the matter by giving too large doses, and made the symptoms worse.

Ladies and gentlemen, I want to say a little more on the subject of condition powders. As I before stated, the use of condition powders, so called, has become almost universal among owners of animals, and are given indiscriminately, especially to horses, without considering what the effect produced may be, or lead to in the future. This keeping an animal perpetually under the influence of a drug, or lot of drugs, until the drug refuses to act in the desired direction, is a pernicious habit, and eventually leads to a state of things altogether undesirable.

I will give you the formula for preparing a condition powder in general use, and which does not differ materially from most of the popular preparations put up and kept for sale by druggists and merchants generally: Fenugreek, cream of tartar, gentian, sulphur, copperas, or sulphate of iron, saltpeter, rosin, black antimony, and ginger, each one ounce; cayenne, one-half ounce; all to be finely powdered and thoroughly mixed. Dose, one tablespoonful once a day, ordinarily; in extreme cases, twice daily. Now this preparation contains some valuable medicines, which I often use in treating animals that are sick. When called upon to prescribe for sick animals, I often find them, to use a vulgar expression, chuck full of the very medicines we would wish to use for the symptoms manifested, were it not that the symptoms present are largely, if not entirely, due to the effect of the drug itself; a state of things that places the practitioner in an awkward and embarrassing position, to say the least. Let us examine a little into the effect produced by sulphur, saltpeter, rosin, antimony, and copperas, on the animal system.

I will take first sulphur: "Sulphur is a valuable medicine for rheumatism, and various disorders. It is also used with grand success for skin diseases."—*Kendall, in his treatise on the horse and his diseases.*

Now I quote from Materia Medica, in Homœopathic Veterinary Practice. I will not give the symptoms in respect to all the organizations of the body, but will confine myself to the skin and external surface, and the extremities. Sour smelling sweats; sweats which are developed on particular parts of the body, especially on the extremities, as the fore legs, chest, ears, etc.; the glands in different parts of the body generally, may be found swollen and inflamed; the animal is very sensitive of having the hair reversed, the skin being generally acutely sensitive and tender; decidence, or falling off of the hair, large surfaces remaining bare, being sore, cracked, and excoriated; scurfiness and peeling off of the skin; intense and constant itching of the skin, the animal perpetually rubbing itself; in fact, we get the very worst symptons of skin diseases from the long continued use of sulphur. In respect to the extremities: Nodosities, and swelling of the joints; the skin symptoms generally as already described; vesicles emitting matter, and forming scales in the creases of the joints, or folds of the joints; swelling of the legs generally; stiffness and numbness of the legs; affections of the nature of bog-spavins, windgalls, etc.; dropsical puffing of the legs, etc., etc.

Saltpeter: This medicine has long been used as a febrifuge, and as a diuretic, and is still held in high esteem by many, but there are other drugs which are better adapted to the treatment of the various diseases for which it has long been used.—*Kendall.*

I will not undertake to give the symptoms of this drug, for you see it is laid aside by one of the old school.

Rosin: This is the residue left from the distillation of turpentine, and is used by horsemen quite freely, and many times is the cause of much mischief, as it is used to a considerable extent to cause the horse to urinate more freely, and in over-doses so frequently given, is often the cause of various diseases of the kidneys and loins. The oftener rosin is given the horse, the more he stands in need of it in the eyes of the driver. The kidneys become overworked; he desires to urinate more frequently; less urine is voided at each time. The mischief is not seen, and the owner hastens to give more rosin, thinking to remedy the defect that he has been instrumental in producing. It should be remembered that powerful diuretics, like powerful purgatives, tend only to weaken and debilitate. If there be a urinary defect, find out the cause, and, if possible, have it removed, and the effect will cease; but do not attempt to do so by force, against all science and common sense.—*Kendall.*

Ladies and gentlemen, that is good enough for me, and what Doctor Kendall says in regard to rosin, will apply as well to the sweet spirits of nitre. I quote Kendall because I presume that many of you have his book, for its sale was somewhat pushed in this State a few years ago, and is a valuable hand-book for horsemen, if the doses that he prescribes are very much reduced.

I will mention only one other remedy in this connection, and that is antimony. Mr. Kendall says this is by many considered a remarkable remedy for the horse for many purposes, but especially to make the horse shine, and to have the appearance of being quite fat.

The fact is, brother farmers, it causes the horse to have a bloated appearance; dropsical swellings of the body and legs. It causes eruptions on the body of a pustulous character, when given a long time in large doses; and perhaps there is no medicine we have that will cure blotches and pimples on the skin of the horse, when properly indicated, than this one; and probably there is no other medicine used in the medical treatment of animals, that has caused so much mischief as this, unless, perhaps, it may be sulphur. Now we will suppose we are called to prescribe for a case, with symptoms like this: Legs swelled considerably; pustular eruptions on all the legs, from the foot to the knee on the fore legs, and from the foot to the gambrel or hock on the anterior extremities; a sanous fluid oozing from the same, forming into scabs, that easily rub off; anasarcial swellings of the abdominal region, extending the whole length of the horse, from the hind to the forward extremities, with eruptions of the same character on the same; swelling of the glands between the fore legs, with urinary difficulties, and irregularity of the bowels. The horse so stiff that he could hardly be moved from the stable. I hear you say farcy, but we may have just such symptoms, and yet not a true case of farcy, but which will eventually lead to farcy if not arrested by proper treatment.

You ask what is the proper treatment of such a case. Now, the symptoms point directly to sulphur, do they not? And sulphur would be the proper medicine if your animal was not already under the influence of the drug. I was called to see just such a case some four or five years ago, and the symptoms above described were those of this very animal. I looked the animal over, and asked how long the mare had been in this condition—this was in the month of March; the answer was, that the first time that he noticed anything of it, was when he was putting in his wheat in the fall, when he observed that her legs stocked some nights, and by-and-by symptoms of scratches appeared, when he gave her a few doses of condition powders, and applied litherage to the sores and dried them up, and after seeding turned her out, and did not see anything more of the trouble until after he had taken her to the stable in early winter, when he noticed that her legs began to stock again, and if left in the stable for several days without exercise, would swell very much, and become stiff and sore; that this state of things existed until about the first of February, when the eruption appeared, and he had exhausted his skill and got discouraged, and though he had no faith, he thought he would try the little-dose doctor. Well, I said to him, Dan., what has been your treatment? The answer was: I have given her condition powders, washed her legs with salamoniac and vinegar, cleansed them with castile soap and water, and applied litherage to the sores to dry them off, and I've got completely discouraged. My answer was: You ought to have succeeded, certainly. I then asked him how many condition powders he had given his mare. Well, the answer was, he didn't know exactly, but some three or four pounds in all, and to use his own expression, "they had got so they didn't do a bit of good." When I didn't wonder. Now, as we have seen that sulphur is a principal ingredient in all condition powders, it would be worse than useless to prescribe sulphur, although in accordance with our rule of prescribing, sulphur was plainly indicated. I confess I was at a loss what to do; other remedies were indicated, but not so plainly as sulphur. I told him I would prescribe for his mare, but at the same time that I thought he had a pretty big elephant on his hands, and that he would have to be patient, for I thought that improvement would be slow, if we got any at all. I gave him directions as to diet, ordering him to stop feeding grain of any kind; to feed hot bran mash and good hay; to cease all outward applications, except to wash the legs clean every day with warm water and castile soap, and dry them thoroughly with soft cloths; and left my prescription, with the promise that I would see her again in a week, unless she got worse; in which case he was to let me know. Not hearing from him in the meantime, at the end of the week I called again, and, in response to my question as to the condition of the patient, the answer was, in his own words: That medicine acts like the very devil; if the mare continues to improve as she has done for the week past, she will be able to go to work by the time the ground is ready for the plough. And, gentlemen, I was a good deal surprised at the improvement that had taken place, for I did not expect it, and the mare ultimately made a good recovery, with the exception of a little stiffness in her fore legs.

Now what was the prescription used? Arsenic and cantharides, prepared thus: One grain of arsenic in one-half ounce of alcohol. I used the white arsenic because I did not have at hand at the time a solution of arsenic. Cantharides tincture first, or one of cantharides to ten of alcohol, to be given in alternation, in ten-drop doses, four hours between each dose, and as improvement took place, to put them further apart. I directed him to shake the vial containing the arsenic, for it does not readily dissolve in alcohol. What do you think of it? Perhaps you may say bosh! humbug! But, gentlemen, facts are stubborn things, and hard to get over.

Gentlemen, I introduce this case, not so much to show the success of my practice, but to show the fallacy and absurdity of drugging animals with powerful medicines when slightly indisposed, the effects of which on the system of the animal you do not understand, for I believe that many of the symptoms developed in the case we have had under consideration, were caused by the drugs that had been given her. It is not to be expected in an article prepared for an occasion like this, that one can enter largely into detail, give you a description, and prescription, for every disease, ache, and pain, that domestic animals are subject to, for the time is too limited; but rather give such advice in regard to the theory and practice of the proper treatment of them, as we understand them, and expose the fallacy and injury arising from giving too large doses of poisonous medical agents.

I want to call your attention to a medicine that has become quite popular among many of late years, and that is aconite. I quote from Dr. Kendall, in his treatise on the horse and his diseases. I refer to him more particularly from the supposition that many of you have his work. "Aconite, an active poison; the leaves and roots are used. A tincture made from the root is much more active than from the leaves. Tincture of aconite root: This is one of the most powerful and successful sedatives in use. It is one of the best medicines we have for the successful treatment of several diseases of the horse, when properly used. In fact, we have no drug which will so well control the circulation, and action of the heart, as aconite. Caution: In over-doses this valuable drug is an active poison. Never give more than five or six doses, if twenty-five drops are given at each dose, nor more than seven or eight, if twenty drops are given. The dose may vary from ten to forty drops."

So far, Mr. Kendall. Gentlemen, according to the theory of practice that I have adopted, the principles of which I am endeavoring to explain to you, I would say these doses are very much too large, and might be the means of doing a vast amount of injury to your animal. I value aconite as a medical agent, as much as any one, and rely on it almost entirely, in the first stages of inflammatory action of any kind; but, ladies and gentlemen, I believe that minute doses of aconite, often repeated, when the drug is indicated as the remedy for the diseased action of the patient, are preferable to large doses; and wait for the action of the drug to pass off before repeating the dose. Take my advice, and never give aconite in 25-drop doses of the officinal tincture or fluid extract. I would reduce the dose twenty-four times, or divide twenty-five by twenty-four, and give what remains. I believe, as a rule, that when the symptoms of the disease are congenial or correspond to the action of the drug employed, that we get a better effect from the small than the large dose. Our aim is to give doses of medicine so small, that while they have a health-giving influence on the disease, they do not prostrate. The animal, having recovered from its first disorder, is not obliged to spend in addition an equal or greater amount of time in recovering from the debilitating effects of violent remedies; from some of which, indeed, they never recover.

But, brother farmers, ladies and gentlemen, as I said before, my time is limited, and it would be impossible to take up each and every remedy used in veterinary practice, and give you the action of each on the animal system, but would say, beware of giving large doses of medicine, the effects of which you do not understand; and more particularly, beware of oft repeated doses of condition powders when your horse is well, and give them very sparingly if he be sick. It were better, as I before stated, that if your horse is off his feed, and no other symptoms to denote any material ailment, to stop feeding him, and let him get hungry. As I said in the commencement of this article, my system of veterinary practice was based upon the principle that like cures like, and that I believed that science demonstrates this fact. I want you to be patient a little longer. I know that we are a little tedious, but I want to bring to your notice some scientific experiments on certain malignant diseases of animals, considered incurable, and in which you are largely interested. You are aware, gentlemen, that there exists among swine in some sections of this country, a disease that has almost universally proved fatal to herds when attacked, called hog cholera, but known as the swine fever, or spleenic fever of swine. There was much speculation on its first appearance as to the cause of the disease, and to discover a remedy for its cure, if possible, but the disease runs its course so quick after fully developed, that it was hardly probable a medicine could be found that would be reliable in a majority of cases, and in order to get rid of the plague, many herds of swine were destroyed, and other infected herds strictly quarantined. It has been discovered that the disease is caused like anthrax, blain, etc., in horses, cattle, and sheep, by bacteria, a species of fungus plant growth, that enters into the circulation, grows, increases, and thrives there (an illustration of which Prof. Beal gave), causing a terrible ferment in the blood, and is largely developed in all the fluids of the body; is imparted from one animal to another by inoculation from contact, or eating from the same feeding places. The treatment of diseases of so fatal a form must necessarily be of an antidotal character; and it would seem reasonable to suppose that from recent experiments made by Prof. James Law, of Ithica, New York, and others, that this anthrax virus, or bacteridian fungus, that causes the disease, could be so cultivated that its fatal effects would become modified, so that the pig inoculated with this modified virus would have the disease in a modified form, stripped of its fatality, and thus antidote the malignity of the fatal virus, like vaccinating the virus of cow-pox in the human system to antidote the small-pox.

The experiments of Prof. Law were made through the medium of sheep and rats. He would inoculate healthy sheep with the poison from the pig, and then after having produced the disease in the sheep, inoculate a well pig with virus taken from the sheep, which caused all the symptoms of the disease in a modified form, and when slaughtered for dissection were, some of them, in a convalescent stage, and no doubt would have recovered. But his experiments did not go far enough, for he did not inoculate any of his subjects, after they had gone through the modified disease, with virus taken from diseased swine. But this will eventually be done, and I believe the hog cholera and anthrax diseases of other animals can, and will, be controlled in this way. For a precise account of the experiments of Prof. Law, and others, on this and the kindred diseases of cattle, you are referred to reports of Department of Agriculture, for years 1878–9.

We have a more satisfactory exhibit, however, with cultivated anthrax virus, by one Pasteur, a French chemist, who, with others in Europe, on account of the exceeding mortality of an epizoötic malady which prevails extensively in that country, though but little known in this, designated as spleenic fever, anthrax, carbuncular disease, and known in France as charbon, which, in its most malignant form, causes death in twenty-four hours after the animal is attacked. Cattle, horses, and sheep are alike subject to it. It is periodical in its character, and like small-pox and other epidemic diseases, creeps along insidiously, until it becomes widespread and alarming, thousands of animals being swept away by the pestilence. In France it is said to be scarcely ever absent, confining its attacks mostly to sheep. In view of these alarming facts, eminent scientists endeavored to discover the cause and a remedy, either to cure or antidote the disease. I have not time to follow the investigations of Pasteur and others, as to the cause of the disease, but it was found that the same, or a similar fungus to that, that causes the swine fever in this country, produced this anthrax disease of Europe, among sheep and cattle.

It had been shown by M. Pasteur, that healthy sheep inoculated with a modified anthrax virus, cultivated in meat juice or chicken broth for successive generations, would not be affected by inoculation with strong virus taken from diseased sheep. The fact was substantiated by Pasteur, through the patronage of one of the Provincial Agricultural Societies of France, which deemed it expedient that these facts should be demonstrated publicly on a large scale. A farm and a flock of fifty sheep were placed at his disposal; twenty-five of these were inoculated (or vaccinated, is the term he uses) on the 3d of May last, and distinguished by ear marks, the operation repeated on the same sheep on the 17th of the same month. The animals all passed through a slight indisposition, but at the end of the month none of them were found to have lost in flesh or liveliness. On the 31st of that month, all the fifty sheep, without distinction, were inoculated with the strongest charbon virus, and M. Pasteur predicted that on the following day the twenty-five sheep inoculated for the first time would all be dead, while those protected by vaccination with the modified virus would be perfectly free from even slight indisposition. A large assemblage of distinguished persons having met at the field June 1, in the afternoon, the result was found to be exactly in accordance with M. Pasteur's prediction; at two o'clock, twenty-three of the unprotected sheep were dead, and the other two died within two hours after; but the twenty-five vaccinated sheep were all in a perfectly good condition. In these experiments we have the fact demonstrated that we can cope successfully with these epidemic diseases, if prepared for them. The swine plague and cattle plague are robbed of half their terrors, if we can resist them in this way.

Ladies and gentlemen, this is science. And what does it teach? That we must employ medical agents to antidote and cure diseases in sick subjects, that will produce a disease similar in character when given in health. Science tells us so; and a grain of science is worth all the guess work in the world.

STOCK BREEDING.

BY I. H. BUTTERFIELD, JR.

[Read at the Jeddo Institute.]

The following is the paper on "Stock Breeding," read at the Farmers' Institute at Jeddo, by I. H. Butterfield, jr., of Port Huron:

Stock breeding is a branch of farm husbandry which is conducted in a measure as a necessity for the farmer himself. He needs his horses for work, his cattle for milk, and beef for his own use, pigs for his meat, and sheep for meat and clothing. It is but a few years since the farmer grew and prepared for use nearly all the products obtained from animals. Now the division of labor does not require so much of the farmer in this line, but he needs the animals and the products just as much. Another reason for breeding stock is the profit. As long as people live, so long will they need meat for food, wool for clothing and all the other articles of use belonging to the animal creation; and therefore the demand will continue. Railroads cheapen and facilitate transportation, but they do not take the place of horses; indeed, they increase the work for teams rather than diminish it. There is very little waste of animal products,—the meat, skins, hair, hoofs, horns, and bones all serve useful ends, while the offal and even blood is used for fertilizers.

There is another object in stock breeding which makes it essential to the farmer. This is to furnish a method of turning the coarser products of the farm into money, and at the same time leaving a large portion as a fertilizer to supply the waste of constant cropping. If the soil would year after year grow wheat without deterioration, or any other paying crop, there might in many cases be no necessity for keeping stock, but as this is not the case the necessity arises for growing other products to rest the soil, and to have animals to consume them and change them into salable products, leaving the residue to fertilize the soil.

It is a well-known fact that a large portion of the food consumed does not go to make flesh and wool, but is returned to the land in the manure. Thus by chemical analysis it has been found that no higher than 75 per cent of the dry matter of feeding stuffs on an average is digested, leaving the balance as a fertilizer.

Stock breeding as applied to pure bred stock of all kinds seems to convey a greater meaning than when applied simply to the breeding and raising for the market, for meat or wool, or of horses for draft or other work; and it may require greater skill to be successful in the former than in the latter, but the same principles apply in both.

I propose to treat this subject to-day in the line of improvement. This is the great object sought and it is what we need, whether we are breeding pure bred stock or grading the common stock everywhere at hand, so as to make them more profitable and useful.

As the gentleman indicated when this subject was assigned to me that it was expected my remarks would relate chiefly to cattle, I take as my subject the "Improvement of Cattle," trusting that as far as the subject is concerned it will meet your approval, for most of the general topics will apply equally to all varieties of stock.

The subject of improvement of cattle is of interest to all; as well to the resident of city or village as to the farmer. The first benefit, of course, is to the latter, as it is to him a source of profit, but it is none the less desirable to the consumer. Genuine improvement of cattle means better steaks and roasts. It means purer, healthier, better milk for your children (which by the way is the cheapest and best food for the young), richer cream for your tables, better cheese and better butter for all.

This must be so, because the same spirit that will cause improvement in the raising of cattle will also adopt better methods of feeding, better methods and greater care in the management of milk, and better systems for the manufacture of butter and cheese. With the greatest improvement, with choice cattle and good food, and perfect care, we should have only the best products and choice meats, and good butter and cheese would be the rule, and not the exception. Consumers may have these if they demand them, and a refusal of inferior products at any price would soon improve them.

You can readily see that there are in this subject many elements of interest to all who use the products of the kine, and that is almost universal. You may be asked a little higher price for what requires more skill and care, but you will readily pay it when you know that you are getting the value of your money. I believe the demands of the table of the wealthy and refined classes of society will be a leading inducement toward the highest and best improvement in cattle products. Good farmers can have no jealousy toward the growth and increase of wealth of the cities, for it will bring to them better prices for better products, and the demand is likely to exceed the supply, for the best.

In the first place the question is asked: "What is improvement?" We breed and feed cattle as we do other stock, primarily for the money they bring. It is also a necessity laid upon us by our system of farming, that we keep stock of some kind to consume the coarser, unsalable portion of the farm products, and in that way turn them into money, and there is no stock that will consume the very coarsest forage to better advantage than cattle.

In a system of improved farming, stock must be kept, and all the forage and coarse grains marketed by feeding, that we may restore to the soil all the elements of fertility that we possibly can to supply the place of that carried away by constant cropping. We keep cattle mainly for the profit they bring in these several ways. It would of course be almost impossible for us to live as we do without their aid, but of these necessities and uses it is not necessary at this time to speak.

There are perhaps some who enter the business of breeding cattle for the "beauty of the thing." These are men of means who breed fine stock as a pastime, and amuse themselves as well as the public, by their endeavors to improve their cattle in some point of color of hair, or shape of horn, or in pride of ancestry, and neglecting the weightier matters of beef and milk, the substantial products which the average farmer must have to make the keeping of his cattle profitable.

I would not disparage the breeding of beautiful animals. I do believe that the man who is an improver of stock, by breeding in such a manner as to change and elevate their character, and make it permanent, requires the patience and skill of a great artist, and the heads and hands that have, by skill in selecting, judgment in crossing, and care in feeding, produced some of the individual specimens of our improved breeds of cattle, are worthy of a place beside the great masters in art.

The great reason for improving our cattle is to make them more profitable, that they may produce more beef, more milk and butter, at less expense, and, therefore, at a greater profit. If high-bred cattle do not do this, they fail of their mission; they have been bred for beauty at the expense of utility, and there is no real improvement, because no real value has been added, and though the breeder may realize fancy prices, the improvement will be a show and not a reality, simply a gratification to the eye, and no addition to the wealth of the country.

There are breeders of cattle who have done this in a measure, and having an eye only to the esthetics of stock breeding, have let go many points of value that cannot be spared from cattle for every-day use. The best improvement will be in the greatest adaptation to the uses we have for them—some only for beef, some for both beef and milk, some for milk alone, but rich in the elements for making cheese, and others for milk rich in butter of choice flavor, like the "golden prints" from the best Jerseys. It is my opinion, however, that the cattle that shall come nearest the mark for the improved farms of Michigan, will be those that most fully combine all the qualities of beef, milk, butter, and cheese.

How is improvement to be made? There have been cattle on the earth, we are told, for six thousand years, but so far as we positively know, but little advance was made or attempted until within a very few hundred years; although admirers of some of the improved breeds, thinking there is much merit in age of descent (notably the Holstein or Dutch breed), claim a nearly pure descent for 2,000 years, which, if they mean in anything like their improved condition of the present, is absurd and without good foundation, for reasons which I shall give that thoroughly convince me that their ground is untenable.

The wild herds on the western continent, such as we formerly found on the plains of Texas and Lower California, certainly could not have been a very great improvement over the pair that came out from Noah's ark; if they had the form of cattle, unless it be that their horns had grown since then, otherwise there had been room for little else in the floating casket which contained the animal relics of the world.

The improvement of stock indicates higher civilization. This is particularly true as to cattle and the small animals. The half civilized Arab has been given great credit for having a noted breed of horses, yet I believe much of this is mere sentimentalism, aided by the mythological tales of travelers, and though there are some particles of truth in the claims made, the imagination has drawn pictures far beyond the facts, and this I could show to you were it not digressing from my subject.

No class of stock has been greatly improved, nor come to any perfection, except as it followed improved methods of agriculture. Even among more civilized nations there has never been rest and quiet for a time long enough to accomplish any great change, provided it were attempted. The primitive methods do not provide food sufficient and regular enough to sustain the improved conditions of animal life, any more than the rude fare and habits of uncivilized life conduce to the growth of intellect and morals in man. The above reasons are sufficient to convince me that the claims to any great age for any improved breed of cattle are fabulous, because impossible under existing circumstances. It is true that the cattle on our western plains are being very much improved, and the long-horned Texan will soon be of the past, but this is being done by crossing with breeds already improved, which are bred in a section of the country where lands are more highly improved, and will continue to be kept up in the same way. Improvement in the cultivation of the soil must come before any great change can be made for the better with our cattle.

And with cultivated farms, "intensive" farming will produce the greatest improvement in cattle as in all stock. This is what has brought to such perfection the wonderful cattle, sheep and swine of England, the rich milk of the Jerseys, and the wonderful yields of the Holstein or Dutch cows. The Merino sheep in Spain had been much improved even under the pastoral methods of the shepherds of Spain in her palmiest days, but how were they then or even now, with their fleeces of three and four pounds, compared to the great French Merino, descended from them, but bred under improved agriculture, with their fleeces of beautiful dry wool weighing twenty pounds and upward, and a weight of body sometimes reaching 300 pounds; or our own American Merino, also descended from the Spanish flocks, so improved under American agriculture that they now yield the largest fleeces and the finest wool known to the world. Intensive agriculture improves cattle because greater intelligence is brought into the field, greater skill is at hand, greater profits promised, and there is more pride in the care and cultivation of that which is beautiful as well as useful. Better food is produced, and better methods of feeding used.

The improved breeds have mostly been made by taking the best stock at hand, and by selection for breeding with care and good management, a constant improvement has been made, until many breeds have nearly reached perfection in special qualities. Forming a breed in this way requires genius, skill, enterprise, and much patience, to accomplish perfect work. The best breeders are born to the work. In the early stages of improvement with most breeds, what we would call excessive in-breeding, was resorted to for the purpose of refining and fixing a character permanently, and on this rock many later breeders have been wrecked, because they have not sufficiently understood the animal economy or lacked the skill to intelligently direct.

I have often heard breeders remark that as Bakewell and Colling, Bates and Hammond improved by in-breeding it will also aid them, and they pursue it regardless of any fixed object to the ruin of their herds. In forming a breed, in-breeding is useful and helpful. It is the quickest way to reduce coarseness to symmetry, and to establish fixed characteristics, but carried too far its refinement quickly descends to weakness and disease. In the present state of our improved breeds of cattle it is dangerous ground on which to tread, unless the breeder knows well his way, and is entirely unsafe except for the most skillful to undertake. Few know well enough the laws of heredity and descent in the animal kingdom to be competent to successfully direct such operations. I do not propose to go into the discussion of methods of breeding pure-bred cattle, as that would require more time and space than I have at present, and I only speak incidentally of in-breeding because I know many breeders over-rate their ability to use this means for the improvement of their cattle. We may breed nearly related in-lines or families, always keeping a strong and vigorous constitution, with advantage, because the inherent qualities become as it were intensified and are more uniformly transmitted. This is what gives value to pedigrees which at first thought may seem fictitious, but when founded on real superiority in an extended ancestry, becomes a most valuable point for a pure-bred animal.

I will farther say in this connection that the great multiplication of breeders of pure-bred cattle does not promise to increase the average quality of merit. So many attempt it from motives of profit or pride to own and keep fine stock, and who do not have the knowledge and ability to carry on a judicious system of breeding, while others expect the improved cattle will grow without feed and can live on air and water, so that large numbers of well bred cattle are so badly used that they actually deteriorate instead of being constantly improved.

In our present circumstances the cattle of Michigan must be improved not by breeding all pure-bred cattle of any one or all the breeds, but by using some of these improved breeds as a means of improving what we call our common cattle. Of the 633,531 cattle in this State probably not over four or five thousand at the highest estimate, are pure-bred registered stock; and the rest are composed of fine grades, common stock, and scalawags, the latter far too numerous for a State that boasts of the intelligence and enterprise of her farmers, and of the high average in value of her crops.

Our cattle must be improved by crossing the cattle we have with some of the pure breeds continuously, and not allowing them to go back to their old places after one spasm of improvement has been passed after making the first cross from which often very choice animals are produced, often equaling in appearance the pure-bred. Inconsiderate or penurious improvers will say, "these are just as good as the pure-bred. I can continue my improvement by means of these grades, and it will do as well and at the same time be much cheaper." This is a great mistake.

Fortunately there are a sufficient number of the pure breeds possessing all the qualities we need that it is not difficult to make a selection adapted to almost any soil and climate.

At the recent meeting of the American Dairymen's Association an address was delivered advocating the formation of American breeds of cattle adapted to the various climates, soils, localities, and uses of different sections of the country. Now this would be a very fine thing to do if it were at all necessary. In my view it is entirely uncalled for. In this country we are situated far differently from the people of Europe, where all the improved breeds of cattle have been formed. The people there are clannish and do not travel far or intermingle with those of adjoining counties or provinces. Many counties in England have their favorite class of cattle which perhaps do not extend beyond the boundary lines; and the separate provinces on the continent have each their peculiar and particular methods of farming and uses for their stock, and also an intense prejudice against anything from abroad, that they must and will have their peculiar fancies gratified in their breed of stock. Beside there is great variation in the surface of the country rapidly passing from rich alluvias to barren hills and moors, making a necessity for different classes of cattle within short distances.

Not so with us. We have, to be sure, a varied climate and soil, but we have no great prejudices of locality. Our wants are nearly the same, and the breeds we now have adapt themselves readily to all localities, and with judicious selection to the various uses and circumstances of our systems of farming. It is far better for us to select from the breeds we have and cross on our common stock and make a jump in improvement in five years that would require twenty, in the effort to form a new breed for each locality.

Though improving our common cattle does not require so high order of ability as the breeding of pure-bred stock, it does require reasonable judgment in selecting, so as to meet the circumstances under which we must work. Beef breeds must not be selected where milk is to be the main product, nor milk breeds where beef is the only object, nor butter cows for cheese making, or cheese makers for the highest butter product. Good judgment would not select quick growing. Early maturing breeds like the short-horn or Hereford for scant pastures. Success and profit will not follow such a course. There are seven or eight breeds of cattle which have been introduced from foreign countries, all of which readily adapt themselves to nearly all conditions of food, soil, and climate, which exist in this country, from the extreme cold of the north to the mild climate of Texas. The Ayrshire from the Highlands of Scotland does well in the south, and the Jersey from the mild air of their native island, improves in the cold region of New England under the care of the best farmers.

The various qualities of these improved breeds, and their comparative value for different circumstances, it is hardly necessary to repeat, and if it was, it would require a separate essay to state fully and fairly the value and quality of all. It is enough to say that there is no one of these breeds with which we are familiar in this state but will make an improvement on our common cattle in some direction. After making selection of the breed best suited to the purpose, the next thing to be considered is the individual value of the animal to be used in making the improvement. The highest breeding is not as important here as in breeding pure-bred stock, and from motives of economy may not always be obtained, but it is a fact that the best bred bulls, those satisfactory for use in the best thoroughbred herds, will make the greatest improvement in grading up common stock, so that pedigree is of value here. Many will say, "I care nothing for pedigree, give me the animal." This is a mistake. It is well known, even with the highest bred animals, that extraordinary qualities, those far above the average of the breed, are seldom transmitted, but that the best results come from those that possess all the essential points combined, with an ancestry that possessed them also. Here is the value of pedigree. There is abroad a very superficial idea regarding pedigrees. A pedigree is not alone a long list of ancestry with high sounding names. It represents value, qualities, pure-breeding, and the longest list where all the ancestry were of the best with no impure or unworthy mixture. The more valuable the pedigree, the animal is more prepotent, and consequently more valuable; and here is a point regarding the age of breeds. It is sometimes contended for a breed that it is of great age, that it is a *race*, if that has any stronger meaning; but take up the history of any of our improved breeds of cattle, and though some of them claim great age, yet they all date the improvement from the beginning of selection for breeding and proper care in feeding, which, with the oldest, is but a century back; and this selection was the origin and the beginning of pedigrees, and they are inseparable from any great improvement. A breeder of ordinary stock will have his herd book, though he may keep it in his own mind, and you will find many an old farmer who will laugh at the modern breeder's estimate of pedigrees, who has in his own yard cattle that he will tell you he values, because he has bred them and their ancestors for years back, and that particular strain never failed to be valuable.

In reference to thoroughbred cattle, I hear many say, "select the animal, and after that the pedigree." I would say select the pedigree first, for it is the most important point in individual merit, and then see that the animal in all his points is worthy of his pedigree. A plain animal, or one with no striking points, but with all the characteristic qualities of the breed to which he belongs and a choice pedigree, will generally breed well, while a fine looking animal with exceptional points and a poor pedigree will often fail. For purposes of improvement, pedigree as well as individual excellence should represent usefulness. For the beef breeds it should practically read, "Sire and grand-sire, dam and grand-dam weighed 1500 and 1200 pounds respectively at two to two and one-half years old. Of Ayrshires and Holsteins it should represent pounds of milk for the year, and with the Jersey, pounds of butter. There are, of course, other points, in size, form, and character. We want good looking as well as useful cattle; but this point of utility is the main one. I speak of this particularly because some breeders of pure-bred cattle have switched off after color, or black points, or no horns, as the main item, cultivating the special to the neglect of the general qualities. Another point is good constitution. Some pure-bred stock is lacking in this essential point. High feeding of breeding stock on fattening food, close confinement with lack of exercise contribute to weaken much of our choice stock and make them valueless for purposes of improvement. It is true that the highest improvement necessarily demands higher conditions and more favorable surroundings, because they are one of the sources of improvement and must be kept up in its continuance. Still there need be no trouble in having choice cattle, strong, vigorous, and prolific; good care and an omission of over care will do it. We must remember that faults of internal organism and lack of constitution can be transmitted as well as faulty external points and more difficult to eradicate; therefore, be sure the animals you breed from are healthy and vigorous.

Another point is to breed in the same line or continuously from the same class of stock. After selecting for purposes of improvement the breed that possesses in the greatest measure the qualities sought, continue with the same breed. It will give uniformity and a stronger concentration of qualities. I am aware that there is a belief quite prevalent that a crossing of breeds is advisable, and it is not claimed that good cattle will be obtained, but that they will be an improvement over the best breed used in the crossing, will be an exception rather than the rule. We have had very few experiments in crossing pure breeds that proved satisfactory, especially if the greater expense over grading up from common stock is considered.

But the most important point to be considered in the improvement of cattle is feed and care. Efforts have been put forth here in Michigan sufficient to raise all the cattle in the State to a very good standard provided they had always been accompanied with good care and plenty of feed. A large proportion of our common cattle have had good blood in them, but it has been starved out, and the last state is worse than the first. If you are not going to feed well, and will raise cattle, stick to the native; they are the best for that purpose. We have some very hardy, easy keeping breeds, but none are so good for the farmer who keeps his cattle on starvation as the pure native, and this is purely an American breed. A great many seem to think that the breed is all that is necessary, and act on that principle; others, and they are many, though they are less than formerly, have said that "feed makes the breed." Both are wrong. A combination of breeding and feeding is what brings good results.

This care must commence at the beginning and continue throughout. Success will not follow starving a calf with the expectation of making it up in the yearling. Starving the cows will not only reduce the quality and quantity of milk, but they will not produce good calves. I have said that we need cattle to consume the forage and convert it into money. This they will do, if they, at the same time, have a liberal allowance of grain, and that is the only profitable way. It does not pay to keep a lot of young cattle six months in winter merely for the purpose of passing a straw stack through them. It can be fined more cheaply with a straw-cutter and horse-power, and besides there is no money in the straw and none in the cattle; but put with it some oil meal, corn meal, and bran, and money can be made out of both straw and stock.

Very few, even the best, are liberal enough with their feed. We do not like to see our cattle eat so much, but we should remember that cattle are practically machines to change food into meat and milk, and the faster it can be done the more profit there is in it. Good eaters are, as a rule, good digesters, and make good returns for the food consumed. If a cow giving milk is given all the food she can use she will repay it in milk, or if she does not and gets fat, the sooner she becomes beef the better. If dairymen would make tests with their cows individually, they could more readily ascertain which were paying and which were not. Tests for the season are what decide and not for a single week or month.

Our agricultural fairs are not doing what they could to encourage the improvement of cattle. They have no standards for judging, and often indifferent judges decide the awards. A premium given for a fat animal picked up at random does but little good. The award should be given for those that make the greatest weight of the best quality in the least time and with the least food.

Premiums for dairy cows as now made encourage nothing. Accurate tests should be required, and quantity and quality of product rule the award. These will come. The fat-stock show has in a measure made the change in reference to fat stock, yet there is room for improvement with them.

It may, however, be taken as a rule that the animal producing the most is the most profitable, at least to a certain limit, accurate and verified tests as to quantity and quality, either of beef or dairy products will be nearly as accurate as could be made with a careful account of cost of feed. That animal that produces the greatest weight of the best meat at the earliest age, is most likely to do it at the least possible cost, and it is nearly as accurate for the dairy class. The premiums offered for these classes at the fairs should provide for these tests, and the premium should be sufficient to induce people to make them. We have long regarded the pure-bred classes as the principal classes to be encouraged, but the time has now come when we should encourage a class of cattle for the purpose of bringing out the utility that is in them, and it is time we let go the old method of guessing at the value of cattle for certain purposes and adopted tests in which the figures will show for themselves. This will require some time and trouble, but the gathering of actual facts in all matters takes time and patience, but after you get them they show something, that continual theorizing will never do. A great many points as to the comparative merits of the different breeds of cattle could be settled by a careful series of experiments, but not all of them, owing to the varying circumstances of location, quality of feed, management, etc.

We now come to the point, "What will be gained by improvement?" There will be no use in making an effort to improve unless there is something to be gained by it. There must be the incentive of profit, in order to make the attempt general. Yearlings at $10 each and two-year olds at $15 to $20, certainly do not pay on any lands in Michigan, and it is doubtful if what are called very good butchers' cattle that are found in the markets and raised on good farms do. We must have better weight at an earlier age. We must have larger yields of milk and butter from our cows. The yield of over 18,000 pounds of milk given within one year by a Holstein cow belonging to Smith & Rowell, of Syracuse, New York, and nearly reached by many others of that breed, and the record of 778 pounds of butter also within a year by the Jersey cow, "Eurotas," show the possibilities in this line.

The number of cattle in the State of Michigan in May last that were over six months old was, of milch cows 311,300, and of other cattle 322,231. If these cows produce 150 pounds each on the average, and that is more than the returns will show, of butter per annum, it would, at 20 cents per pound, net $30 for each cow, or $9,339,000 for the whole product, and if the cost of keeping these cows is $25 each the profit is $5 each.

Now if the product of these cows can be increased to 200 pounds even at an increased expense of $5 each for feed, at the same price, the profit per cow will be $10 instead of $5, and the total value increased to over $12,000,000. If by improving these cows still more and feeding still better the annual average can be raised to 250 pounds at an additional average of $5 each, the average profit will be trebled from the first and the total value nearly doubled. If we could raise it still higher and reach 300 pounds, and who will say that we cannot, even at a cost of $40 for keeping, we shall have an average profit of four times the first, and a total value of $18,678,000. Besides having better stock we shall have better butter and get better prices, making the profit still greater. These comparative figures are fair, and the last amount not beyond our reach.

Our wheat crop is the most valuable crop we now have, but we can keep cows enough to have their product equal to our wheat and still raise as much wheat as we now do. It has been demonstrated that where the most wheat is raised the most stock is kept. You have all seen the very fine wheat map of Michigan giving the bushels raised and the average in each county. When the first one of the kind was issued in 1878, I think, Dr. Miles, formerly of the Agricultural College, showed from statistics that with hardly an exception the counties having the greatest average of wheat per acre had also the most stock for the acres of improved land.

Our State has no statistics of milk and butter product, and the United States census is not complete for 1880; but in 1870 the cows in this State averaged only 100 pounds per cow, accounting with this, cheese made and milk sold.

A poor show for profits, is it not? And while we are adding by improvement to the value of our product we are also increasing the value of our stock very fast. A cow that makes a profit of $20 is worth just four times one whose profit is $5.

We have seen the value of improvement in milk production. How is it with beef? If our cattle are sold on an average four years old, and at an average weight of 1,000 pounds, the age can be easily reduced to three years for the same weight, thus saving a year in time and interest and risk, even if it takes the same feed. If we can, by better feed and better breeding, increase the weight to 1,200 to 1,500 pounds at 2½ to 3 years, we shall not only save in time, get greater weight for the same feed, but get much better price per pound, increasing the profit very much. The present market value of a steer well fattened, weighing 1,500 pounds, is $1.50 to $2 per hundred more than for one of 1,000 pounds, which of itself is a fine profit.

I have given enough to indicate the importance of an awakening in this matter that shall rouse the average farmer to better methods.

This matter of early maturity is a very important point in a country where we have to feed our cattle in the barns for half or more of the year. The sooner the desired weight can be secured with the same feed, the more profitable will be the feeding. It will not pay to secure weight in calves by feeding entirely new milk. Nor is it necessary. Skimmed milk with an allowance of oil meal to take the place of the fat removed from the milk, will give larger growth of bone and muscle, and the young animal can be made at two years old quite the equal in weight of one fed from birth on new milk. Of the feed given a fattening animal about three-fourths goes to supply the daily wastes of life without producing any gain, while it is the last quarter from which the profit comes. Is it profitable then to refuse the latter and thus throw away the former, receiving absolutely nothing from it?

I have not mentioned all the means of improvement nor all the value there is in it. I could give figures and statistics which might be more dry and tiresome than what you have already heard. I think I have given enough to indicate the importance of an awakening in this matter that shall arouse the average farmer to better methods and practices in breeding and feeding his cattle. I have made only such statements as can be demonstrated, or have been approved, in practice. I speak for no impracticable methods, no fancy farming theories that fine stock must be kept whether it pays or not. The general farmer wants to make the most of his labor, and I am satisfied that this lies in the path of improvement. I do not claim that there is now no improvement going on, but there is not enough. There is now an awakening all over the country, particularly in the west where the improvement is greater than with us. And if we are to compete at all with them we must exert ourselves to the best improvement by better breeding and better feeding.

To conclude, we have seen that improvement is to increase the value of our cattle and their products. The means are better selection and breeding, and better feeding, and the gain, a vast increase in wealth to individuals and to the State. What we need to accomplish this is better farming, more enterprise. We need to study and learn more. There is much to be learned in regard to foods. All should know that foods for stock have different elements; that nitrogen produces flesh and bone; that carbon produces fat and heat; that the best results in feeding will be reached by a proper combination of flesh forming and fattening food, suited also to the appetite and digestion of the animal and with reference to the product we wish to obtain, whether growth, or milk, or fat. The science of breeding is still in its infancy. The laws of heredity and transmission of qualities in animal life are but imperfectly known even by breeders of pure-bred stock. We need to learn in all departments of our agriculture, and if these institutes shall but show us our weakness, and awaken an enthusiasm that shall beget an improvement in ourselves, our farms, and our stock, their object will be accomplished.

MANAGEMENT OF THE DAIRY.

BY MRS. ALBERT GRANGER.

[Read at Hastings Institute.]

Mr. President, Ladies and Gentlemen,—The subject I am requested to bring before this meeting is of importance enough to be handled by a more experienced and abler pen than mine. Thirty years of hard work in a farmer's kitchen is not likely to develop a woman into a very brilliant writer; therefore, I shall ask very much leniency in your criticism.

As the foundation of the dairy is the cow, it is essential she be selected from the breed best adapted to whichever branch of the business you wish to follow. The Jersey cow gives a milk peculiarily adapted to butter, and usually very rich. The Ayrshire cow gives a milk not as well adapted to butter, but better fitted for cheese. So if you please we will take up the Jersey cow (or any other you may happen to have) and the butter making, leaving the cheese to the factories where most of it has been made since the days of our grandmothers.

Now we have the cows. We will go back to the pasture and secure sweet and nutritious grasses and the purest water, as milk and butter of the finest quality cannot be produced from weeds, sour grasses, slops, or impure water. The cows should be driven to their stalls to be milked and pass the night; they should here receive some feed and be bedded with clean straw. They should be carded regularly, not only for the sake of looks, but to insure that cleanliness which is such an essential condition to the procuring and handling of milk. The cow should be kindly treated, and milked at regular intervals by the same person, who should enter upon his or her duties with hands not soiled with the filth of the stable, but scrupulously clean. Tin pails are preferable to wood, as it is very difficult and almost impossible to cleanse wooden pails so perfectly that they will not impart some degree of acidity to the milk.

Now we have the milk. We will take it to the dairy room, strain it, and set the pans, not on shelves but racks, so the air may circulate freely under as well as over and around them. The milk should be kept cool in summer, never being allowed to reach a temperature above 60°, though it may fall below that without detriment. The advantage gained during the hot season by the rapid and complete cooling of the milk as soon as it comes from the cow can hardly be overestimated. Experiments show that milk thus cooled keeps sweet much longer and yields its cream more readily and abundantly; and experience has proved that the quantity of butter depends greatly upon keeping the milk in such a state as to secure all the cream; and a saving of labor is also effected by this process, as the milk, when cooled to the right temperature, can be set in deeper vessels, thus diminishing the number used, consequently the labor of cleansing them. There are many methods more or less simple for cooling milk aside from the patent coolers. Perhaps the simplest one within the reach of every one is a box partly filled with cold water, with pails set in to receive the milk as soon as drawn from the cow, and letting it stand until of the required temperature.

Much of the success of butter making depends upon the fitness of the room where the milk and cream is kept, and upon its condition as to cleanliness and freedom from taints and odors of every description. If a cellar is used it should be dry, quite light, with a free circulation of air, and clean to the remotest corners, with no remnants of decayed fruit, vegetables, or anything possible to give it a taint. If a milk-house is built, which is, perhaps, better, it should not be situated near the hog pen or stable, nor should anything be allowed in it that would be likely to impart its odor to the milk; for nothing receives a taint more easily than milk or cream, and all bad odors absorbed by the milk are sure to be concentrated in the butter, and they will not be accommodating enough to run off in the buttermilk, either. We have the milk set, the cream raised, and will next proceed to the skimming, which should be done as soon as the cream has all risen, and before the milk has become too sour. The time for the cream to raise, of course, depends upon the temperature. The time it should be removed is when it has a rich, yellow, uniform color, and such an adherency of particles as will enable one to remove the entire cream with one dip of the skimmer. If allowed to remain too long on the milk, both quantity and quality will be seriously affected; the surface will become discolored, while underneath it is rapidly yielding to the corrosive tendency of the acid in the milk. Cream, for the same reason, should not be kept too long after being removed before churning, which is the most laborious part of the work if done by hand; therefore, we should be careful to have the cream of the right temperature, about 60 or 62°. An experienced person may guess at this with tolerable correctness, but it is better to use a thermometer and be sure, as a mistake may tax a person's strength and patience, equal to the cost of a dozen thermometers; the churning should be done steadily and ceased as soon as the butter is well gathered. I am not in favor of coloring butter; I consider it a cheat and a fraud, but if it should be resorted to, the color should be put in the cream, then the butter will be of a uniform color; but proper feed for the cows will obviate the necessity of artificial color. While salt is not to be undervalued as a preserving agent, it must be remembered that too much of it will destroy the fine flavor of the best of butter; use just enough to remove its insipidity; about one ounce of Ashton salt, sifted, to a pound of butter; on no account should it stand too long after being salted before the buttermilk is worked out, as it is apt to become streaked, and a tendency to rancidity will be rapidly developed. I realize the difficulty in giving explicit directions for the second and last working; if not worked enough it will spoil; if worked too much it is spoiled already. It should be worked with careful, gentle, yet firm pressure, and not by indiscriminate stirrings, and spattings, and grindings against the sides of the bowl. Butter is composed of minute grains or globules which are crushed by this careless handling, thus rendering it greasy and sticky, whereas it should retain its clean, solid individuality. It should not be worked until it is perfectly dry; it should have a slight moisture about it—a sort of insensible remnant of the clear brine that has been working off. Never work butter with the hands; besides being an uncleanly practice, it makes it greasy and disagreeable, if not positively bad. In packing, the jars or tubs should be scrupulously clean and sweet, the butter packed in solid and a cloth laid on the top with a laying of salt on the cloth; the cover should fit close, leaving no room for air between it and the butter. When butter is taken to market it should present a neat and attractive appearance; if taken in rolls each roll should be wrapped in a clean, damp, white cloth to prevent the rolls sticking together and looking broken and rough. That there are many defects in the present system of managing the dairy on many of our farms is an undeniable fact, but in many cases I think it is more a lack of conveniences than the fault of the farmer's wife. Some, of course, will not take the extra trouble to make a good article, saying "they get as much for their butter as Mrs. A. does for her gilt edge, and don't work half as hard to make it." Well, perhaps they do, and they get a bad name besides. I hope the day is not far distant when creameries and butter factories will be established at convenient distances through the country to take the milk from the farms, thus dispensing with the drudgery incident to the care of milk, and leaving more time for the wife and daughters to read and study and cultivate their minds, that if called upon to write an essay for an occasion like this, they would not so keenly feel their inability to respond to the call.

FEEDING STOCK.

BY J. C. BRAY.

[Read at Hastings Institute.]

Mr. President,—It has fallen to me to read an essay on feeding stock; this should have been placed in abler hands than mine. It is a subject that interests every cultivator of the soil, especially the farmer who practices mixed husbandry. The kind of stock to be kept upon the farm and feed, so as to make a profit, depends upon the farmer and the condition of his soil. To make the feeding of stock profitable to the farmer, he should adopt a rotation of crops, that he may feed all he raises. The most important question with the feeder is the selection of the stock he is going to feed, for unless he uses good judgment in buying or raising, he will surely fail in his selling, as the buyer always pays according to the quality of the animal he buys. Animals should be selected with reference to early maturity. The most profitable time to feed, I claim, is during the first two years of an animal's life, as the growth is greater at that period, and costs less per pound, than at any other age. To prove my assertion, I will take a calf that has been well fed until one year old and weigh it, and I will have to keep it until it is three years old to double its weight by feeding equally as well as before, so you can make a pound of beef cheaper before it is two years old than you can after that age.

The same is also true in sheep feeding. There has not been a winter in the last twenty years that I have not fed cattle or sheep, some years both; but I have not conducted the matter in that systematic manner by which as accurate results are obtained as I should have desired, yet I know the feeding of stock for market has been a source of profit to me. My practice has been, during the last ten years, to buy my cattle—steers mostly from one to three years old—during the summer or fall, or when ever I could strike a bargain. Right here, I think, is where the profit or loss comes, for there are cattle that would be dear at almost any price for feeding purposes. Amongst this class are old oxen, old cows, or stags, or cattle that have been half starved from a calf. A farmer could never put his hay and grain to a worse use than feeding such stock for market. I never bought but one pair of old oxen to feed, that was the poorest investment in cattle I ever made. The feeder should never buy any but thrifty cattle; if he does, he will, in my estimation, feed at a loss.

When my pastures get short in the fall I put my feeding cattle in the stables at night and give them what hay they will eat, and a little mill feed or corn chopped up, so as to keep them in a thrifty condition. When cold weather sets in I think it best that the cattle to be fattened should be confined to the stable during the most of the day, in fact, I think they would gain more by keeping them in the stable all the time, but it is a convenience to turn them out to water, which should always be near at hand, and in sufficient quantities. I am feeding now twenty steers, two and three years old,—each animal is fed four quarts of meal in the morning, and what hay it will eat till about ten o'clock; then they are turned out to water, the stables cleaned and bedded with straw, the mangers cleaned out, and about two or three o'clock the cattle are again put in and fed the same amount of meal, and all the hay they will eat till morning again.

In feeding sheep, my practice is to buy sheep after shearing, or whenever I can buy so that I think they will pay to hold, or when my pastures will permit of more. In the fall I sort out what I intend to feed for the winter. I have found it pays me to have an even lot, but I much prefer the fine-wools for fattening, as they are healthier and stand close penning better. Last year I fed a car load of fine-wool wethers, 180 of which I kept an account of the number of days and amount of feed fed them, so I could tell what was the profit or loss. I have a pair of Fairbanks's scales in my barnyard, and the sheep were weighed when put in the pens, and when sold. They were fed just seventy days. In the first place I will give the cost of the sheep, so we can see whether it pays to feed them. I am certain I got a greater profit on what I fed the season before, but I did not weigh my feed, so that I could not give as accurate results. I also fed four good thrifty steers last season. I weighed their feed and the steers (the same as the sheep), of which I will give the profit and loss. They were all bought from April till October, in 1881:

Debit.

1881.			
April 1.	To 60 wethers at $4.40 per head	$264 00	
" 2.	" 100 " " $4.00 " "	400 00	
	" Feed till grass	25 00	
	" interest on money till February 1, 1882	37 00	
	" two barrels of salt	3 00	
	" pasture	30 00	
	" washing and shearing	15 00	
Aug. 30.	" 20 wethers at $3 per head	60 00	
1882.			
Feb. 1.	To 3 pounds of hay each, for 70 days, at $10 per ton—18½ tons	185 00	
	To 50 bushels corn at 60 cents per bushel	30 00	
	" 50 " oats " 50 " " "	25 00	
			$1,074 00

I have not charged any thing for time, as I think the manure enough for that.

Credit.

1881.			
July 1.	By 160 fleeces of wool, 7 pounds each	1,120	
	Sold for 35 cents per pound		$392 00
1882.			
Feb. 1.	By 180 sheep		950 00
	Total credit		$1,342 00
	Debit		1,074 00
	Profit		$268 00

The 180 sheep weighed November 21, the day they were put in pens, 17,910 pounds, and weighed February 1, 1882, just 70 days when sold, 19,844 pounds, making a gain in 70 days of 1,934 pounds; not enough to pay for the feed the 70 days by $144.80. The whole feed the 70 days cost $241.50, but the sheep being bought from 2½ to 3 cents per pound, left a good margin.

Debit account with steers.

1881.			
Sept. 10.	To four steers	$152 00	
	" interest on money till February 1, 1882	4 45	
	" hay from October 21, 1881, till February 1, 1882, 100 days, 18 pounds each per day, at $10 per ton	36 00	
	" 12 pounds of middlings and oats each per day, for 100 days, at 80 cents per hundred weight	38 40	
	" salt	30	
			$231 15

The feed for the four steers 100 days cost $74.70.

Credit.

1882.		
Feb. 1.	To four steers weighing 4,985 pounds, at five cents per pound	$249 25
	Debit	231 15
	Profit	$18 10

The four steers weighed when put in stable 4,370 pounds, a gain in 100 days of 615 pounds; not enough to pay for the feed 100 days at five cents per pound by $43.95, but the steers being bought at 3½ cents per pound and sold at 5 cents per pound, left a small margin, and I sold my hay at the barn at as much or more than it would have sold for in the market, besides leaving me a large manure pile, which I think worth more than the work taking care of cattle.

If in what I have written there be found a suggestion that should prove profitable to an individual, I shall feel that my object has been fully attained.

THE BEST BREED OF HOGS FOR THIS LOCALITY.

BY A. WHITNEY.

[Read at Trent Institute.]

This is a question of vast importance to farmers. The hog, in my opinion, is the most profitable stock kept on the farm, as far as dollars and cents are concerned; the best machine for converting our coarse grain and offal into money. The hog is not a dainty animal by nature, but preferring good feed to poor, and like other stock, the better they are fed and cared for the more profitable they are. It is stated by eminent writers on the subject, that it takes but a trifle more than half the fertility from the soil to produce a ton of pork than it does to produce a ton of beef or mutton, and takes not much more than half of the feed to produce it. If this be a fact, then I assume the profitableness of the hog is established.

The next question to be considered is, "What is the most profitable breed to raise?" I answer, the breed that will produce the most pork for the feed they consume. Fancy may dictate a hog of a particular color, but as the pork is just as sweet and commands just as high a price in market from a black hog as a white one, I shall not take color into consideration. There are some of the small breeds of hogs, such as the Suffolk, Yorkshire, and Essex, that keep and fatten very easily; but there are very serious objections to them in my way of thinking, namely: They are too short-bodied, although producing very good hams and shoulders, but hardly any side pork; besides some of these have not hair enough to protect them from from the winter's cold or the summer's sun; and when fattened there is not much of them at best. On the other hand, some of the larger breeds, such as Chester White and Jersey Reds, will produce a large amount of pork, but it takes them a great while to mature and a great amount of feed to fatten them. We want a breed of hogs that combines the qualities of both the large and small breeds that we have in the Poland China; they combine all of the excellencies of both the large and small breeds, being very quiet and docile, excellent feeders and breeders, capable of fattening at any age, yet attain great weight at maturity; in fact, they will grow and take on fat as long as one has a mind to feed them. They usually weigh from 250 to 300 pounds at ten or twelve months old, and from 500 to 600 pounds at eighteen months old. The question is frequently asked, what makes or constitutes a Poland China hog; from what were they originally bred? The history of the breed is this: This breed originated in southern Ohio, in Warren and Butler counties, in the year 1837, and became an established breed in 1840; they were produced from four pure and distinct breeds, three of which were imported, namely: Poland, Big China, Big Irish, Grasies, and Byfield. The Poland China hog is of fine bone but of large size. They are dark in color, usually black, with small, white, promiscuous spots. They usually have some white in the face and about the legs and feet. They have long bodies, short necks, heavy jowls, short legs well spread, broad, straight backs, deep sides with square, heavy shoulders, broad, deep hams, frequently the meat overlying the lock joints; ears thin and soft, drooping at the point. They have no flabby, flank meat, but are thick in front of ham, and have but very little offal when fat. They are strong and hardy in constitution, and finally they will make more pounds of pork for a bushel of corn than any other breed of hogs in America.

HOGS, AND HOW TO HANDLE THEM.

BY B. G. BUELL.

[Read at Galesburg Institute.]

Let us look at this question in its practical bearings. Let us examine it in a money point of view, a point in which farmers are more generally interested than in any other of its aspects; for where a farmer's money is, or where he sees a prospect for acquiring money, in that direction will he use his best efforts.

The field open to the American farmer is a wide one, and look whichever way we may, we will find it occupied by active, pushing, and energetic men, each one striving to fill the demands in his particular line of production in a better manner or at a cheaper rate than his competitor. Hence the diversity of agricultural products; and yet a sameness of products in particular sections, as winter wheat raising in Michigan, corn growing in Illinois, spring wheat growing in Dakota, etc., and still in other parts pasturage for exclusively wool and beef production.

All these special departments of farming are well enough for a time in a country so extensive and diversified as this; but the continual growing of one kind of grain or crop will exhaust the elements in the soil required for that particular crop and make its growth unprofitable; and are we not admonished by our frequent light crops and partial failures of wheat in this portion of Michigan that it is about time for us to change, or at least make a partial change, in our systems of farming? I believe it is for our true interest to raise less acres of wheat and produce more and a better quality of live stock; and as the transition from grain raising or wheat raising can be more easily made at least in part by hogs than by cattle or sheep, I would recommend that class of live stock to experiment with, and for the following reasons:

First, It will cost less money for first purchase of stock;

Second, It may be more safely done by those not accustomed to their care than can improved breeds of cattle or sheep;

Third, The stock can be much more readily increased or diminished as the prospects appear for a high or low market price;

Fourth, The market for hog products is more extended than any other meat product, and subject to as little fluctuation as any.

There is no department of the live stock question that presents a wider field for investigation or promises more remunerative returns. If you take into consideration the vast territory over which the porcine race is diffused, the value of its products, the certainty and dispatch with which, by its aid, the great corn fields of the west are profitably condensed and cheaply transported to paying markets, you will not be surprised to see that it stands at the head of the live stock growing interests of the United States.

In looking over our agricultural papers a person would naturally come to the conclusion that the cattle department was the principal source of the meat product of this country. And why? Because its advocates are continually bringing its claims before the public.

What are the facts? The statistics of our great shipping, packing, and exporting centers show that a large majority of values of all kinds of live stock products comes from the hog. Therefore, in view of the great interests involved in this question, it becomes us to look well to the ways and manner of its continuance that it may go on as prosperously and as profitably as in the past, and if possible make improvements that will render it still more profitable in the future.

There are many reasons why Michigan farmers should look into the merits of live-stock growing, some of which are the following, viz.:

Wheat growing is subject to more insect enemies than when our lands were new. More labor and expense are necessary to fit our fields for good yields than a few years ago, and the seasons seem to be more capricious than formerly, as we have witnessed more winter killing and blight; and again, the past season, Michigan wheat growers have been subjected to more loss from the two weeks almost constant rain immediately after and during wheat harvest than they have ever lost from hog cholera.

There is one more reason which I will name, and which we are all looking to, and feeling most severely in our pockets. The lands of Minnesota and Dakota which but a few years ago were considered as barren wastes, fit only for the wild Indian and buffalo, are now pouring their golden streams into our markets at rates that we cannot compete with, and have any reasonable pay for our labor. In other sections where wheat had failed from natural causes the farmers have made changes in their management and productions, so that where wheat raising was the principal business, now stock raising, dairying, and wool growing have taken its place, and are paying the farmers better than wheat raising ever did in its palmiest days, in proof of which I cite you to northern Illinois and southern Wisconsin, and the best portions of western New York.

There is no section of our country better adapted to a mixed husbandry than southwestern Michigan. I would not recommend that hog raising be made the exclusive stock product of any farm, but I am confident that it may be largely increased on many farms and made to pay well. Where dairying is made a permanent feature, there hogs work in to good advantage.

If there are any persons here who are disposed to look upon the hog as an unclean animal, and fit only for the abode of evil spirits, permit me to say to such that you have but a faint idea of the perfection to which the modern porker has arrived. The rapid growth, early maturity, the quiet disposition, and I may say the civilization of the improved hog of the present day, have made its rearing, feeding, and general management a very different kind of business from that which was considered the right way a quarter to a half century ago. Our farmers, especially those who are engaged in raising improved stock, are learning that it does not pay to raise wild animals on the farm, and they find that even the hog, by kind and gentle treatment, is susceptible of improvement in disposition and manners.

The rapid increase and quick growth of the pig makes it possible to take advantage of unexpected large crops of corn as has been witnessed the past season, and in case of failure of corn crops the same qualities apply with equal force. They can be disposed of before having cost the farmer so much as to impoverish him for the season in buying high priced grain to feed them until of a proper age to fatten them, for it is understood that the proper way is to have them in condition for market at all ages. It is an unsettled question, or one at least that has advocates on both sides, whether it is more profitable to have pigs farrowed early in spring and push them with high feeding to market at eight to ten months old, or have them farrowed later, say in May and June, and feed moderately, letting them get a large portion of their sustenance from clover pasture the first season, and the second summer live entirely on pasture until in August or September, and then feed a few weeks on corn and market them early. A much heavier weight can be made by the latter process, and a larger portion of it is made on grass, which is the cheapest and one of the best of earth's productions for making animal growth. By planting early varieties of corn for part of the crop it may be ready for feeding the hogs as soon as the middle of August, and after four to six weeks on corn they will be ready for the early fall market, which is usually better than the late fall market. Both systems have their advantages and defects which nearly balance.

One of the most important items in a profitable rearing of the pig is to keep it growing each and every day of its life. The careful pig raiser begins to feed his pigs as soon as they show any disposition to eat. If it is to be had he tempts their appetite with a little sweet milk, put before them in a place where the sow cannot reach it, and soaks shelled corn for them as they advance, and does not forget to feed the sow well at the same time. The farmer who has a dairy has an important advantage in raising pigs over him who has not one. But it is not necessary to have a dairy to raise good pigs; other feed than milk can be substituted with success.

The profit in any kind of stock farming comes from constant care and good management more than from hard work. The sleeping place of the pigs should be dry and not dusty, and in cold weather protected from currents of wind. Salt and ashes are good things to have where they can go to them at any time. Corn is the best grain for fattening hogs, and may constitute an important factor in the feed of pigs; but be sure they have more of milk, oat meal, barley, mill feed, or something that tends more to bone and muscle growth than to fat.

So far as breeds of the improved swine are concerned choose any one that your fancy may prefer, but when you have made your selection do not fail to breed from pure stock on side of sire.

From a somewhat extended experience in breeding several of the popular kinds I have adopted the Poland China as the one that suits me best. I think it has qualities better adapted to the general farmer, and especially to one who wishes to raise hogs in large numbers, than any other breed with which I am acquainted. In the first place, it has large growth and fine quality, and will fatten at any age, and if well fed will continue to grow and make a large hog. In the second place it is hardy and prolific; third, it is quiet and peaceable in disposition, valuable qualities in the breeding sow; fourth, it is a hearty eater, and assimilates its food to the best advantage, without which quality, as a meat-producing machine, it would be worthless. It is also what may be termed a good grass hog; that is, it will thrive and fatten on good clover or blue grass pasture. It has another good quality. Its color is right; a black or spotted hog will carry a smooth and healthy skin through rain and sun, through heat and cold, where a white hog will have a sore back, cracked ears and a mangy appearance.

One thing more and I will not weary your patience longer. The marketing of your hogs is another important item in the scale of profit; keep posted in the market, and when you sell, sell to a man you have confidence enough in to believe he will give you fair weight if you are not looking at the scale beam. These may be small matters, but remember that all successful business is made so by looking after the particulars, each one of which is necessary to make the whole complete.

HOLSTEIN CATTLE.

BY JOS. MERRICK.

[Read at Trent Institute.]

The Holstein, a Dutch breed of cattle, said to have originated in the duchy of Holstein, and perfected in Holland, whose cows were acknowledged to be the most celebrated throughout northern Europe, is perhaps the purest breed of cattle in existence, it never having been esteemed necessary by the improvers of this race to cross in other breeds. Originating, as it did, in a country where dairy husbandry is a leading feature in agriculture, and was, centuries before English breeders began the improvement of their now famous Durhams, Devons, Herefords, Short-horns, etc., we must immediately grasp the idea that the breed certainly includes numerous good points, or to-day it could not be par excellent, with a people famous even in the seventh century (nearly 1,200 years ago) for the most famous cattle in existence.

In the year 1864 there were 943,214 cows in Holland, which exported her surplus butter, 32,000,000 lbs, and cheese, 61,000,000 lbs. When we come to reflect that it is in the north of Holland that the Holstein has been brought to its present degree of perfection, and that the agriculturists of that district concentrate their whole energies upon butter and cheese making, and have gained a world wide reputation for these products, we are impelled to believe that their favorite Holsteins are famous milch cows at least.

Our own observations will bear us out in the assertion, that for milking qualities this breed stands unrivaled at the head of all others.

I believe that a comparison of well authenticated statistics will prove this to the satisfaction of the most skeptical. It is not my purpose to disparage other breeds that the Holsteins may stand out pre-eminent as milkers, butter makers, or cheese producers, but in this brief article to give a concise sketch of their origin, appearance, and leading characteristics. Their origin we have already noticed; of their appearance we will now say, the color of pure bred Holsteins is black and white, either color may predominate, handsomely and distinctly marked sometimes with large patches of black, but generally smaller spots, having large frames, with the appearance of vigorous constitutions, having straight back, well developed belly, strongly formed legs, with smooth joints, soft and silky hair, upon a mellow handling, movable skin; the cows being possessed of broad and drooping udder, well formed teats, the milk and blood vessels on the belly and about the udder broad and vigorous; general weight of cows about 1,500 pounds, males, of course, being much heavier. I have in my possession at this time a fine male, registered in the herd book (vol. 4, No. 568) Rarus, and purchased of I. D. Jackson, St. Joseph, county, Indiana, which at two years old weighed 1,782 pounds, and now at the age of three years and three months, in good showing, will, I think, weigh 2,300 pounds. It is claimed by some that the Holsteins as milkers, are rivaled by the Ayrshire, as butter makers by the Jerseys, as beef producers by the Short-horns, Herefords, and Galloways, and as working cattle by the Devons. Well, what of it? Which of the breeds just mentioned but the Holsteins possesses all of the qualities here listed—milkers, butter and cheese makers, meat producers, and working cattle, in any eminent degree?

Let us first compare the Jerseys, which if they make no more butter than the Holsteins, it is claimed the flavor is much richer and finer. Who among us have tastes educated to that point that we could tell the difference without being told? I say, without hesitation, there is not one, and as nature fixes up things to suit herself, we may reasonably conclude that half the issue will be males, which turned off for beef at two years old, will not be large enough to afford any profit; the same, or nearly the same statement will apply to the Ayrshire. While the Short-horns, Herefords, and Galloways possess two of the qualities to be desired by the general farmer—that of beef and working cattle—they are not preëminent for milk, butter, or cheese. Some of the families of Short-horns, bred for beef and beauty, giving no milk at all, or at most, not enough to raise their own offspring, and it is just this uncertainty about milk that unfits the Short-horns for a dairy breed, some being almost unrivaled for milk, others entirely worthless.

The first importation of Holsteins to this country, of which I can find any authentic record, was made by the West India Company, in 1625; subsequent importations by the Dutch settlers in the State of New York; by Consul Jarvis, of Vermont, in 1810. In 1852 W. W. Chenery made his first importation, and several more importations up to 1861.

The Holstein Breeders' Association was formed, and the first volume of the herd-book published in 1872, and its pages recorded 61 males and 63 females, which comprised nearly all the full bloods in the United States. The second volume was published in 1875, and showed 171 males and 234 females, and so on; the numbers have steadily increased until the fourth volume, published in 1879, shows 377 males and 811 females.

This breed has been thoroughly tested in nearly all parts of this country, from the wooded hills of Maine to the rich pastures of California's fertile vales, and south to the sunny slopes of Virginia, and have given, I believe, unqualified satisfaction. One very important characteristic in the Holstein cow is her tendency to continue long in milk with remarkable steadiness and uniformity.

There are many good cows of other breeds that give a large yield of milk for a few months, then fall off rapidly and go dry for perhaps three or four months. Not so with the Holstein.

Crown Princess, the property of G. S. Miller, New York, was in milk 1,821 days, and yielded a daily average of 33.56 pounds, that is 61,112 pounds during the entire period. Mr. Miller in his report averaged in three years 946 days in milk; another breeder records full bloods per year, 358 days, grades 335, natives 265, and some breeders state that some of the full bloods have to be forced dry. I consider this a good breed to cross upon natives, being the purest breed—they impart at least six-eighths of their qualities to their offspring. I have a pair of grade heifers sired by Spartan, imported by the Fox River Association, and registered in the Holstein herd-book, whose dams were common natives. These heifers show good form, fine, soft hair, and with the same care and feeding, have very far outstripped good natives of the same age, and some grades and Short-horns. And the sire of those Short-horns, the 2d Duke of Huron, is as fine an animal as can be found in this or any other country. I consider it worthy of remark, in my conclusion, that the Holstein, as far as my experience and observation go, is as good if not the best breed for the farmer engaged in mixed husbandry, who wants the heifers for cows and the steers for beef or working cattle.

FINE WOOL HUSBANDRY.

BY JUDGE W. W. STICKNEY.

[Read at Lapeer Institute.]

In this State the farms are, on the average, small, and the number of sheep a man can keep will necessarily be small as compared to sections of country where there are extensive barrens, or openings, for sheep farming, and as most of our lands are of such a nature as to be suitable for the feeding of the larger varieties of sheep, it has always been a mystery to me why so few of our farmers raise long wooled sheep, or at least medium wooled, which would give an average good fleece, and at the same time have some bulk of eatable mutton to spare after the wool was off. I have been told that long wooled sheep did not do well here, that the soil was not suitable, that the climate was not such as they require, that they degenerated in one or two years. As far as the soil is concerned there can be no possible objection. We have every variety of soil fit for sheep pastures, especially long wooled. The soil and climate are identical with that of Ontario, where long and medium wools do as well as in any country. As to degeneration, I have become satisfied that careless feeding and selection in breeding is the cause. It makes little difference what stock you have, how pure in blood they are, want of proper care of either long or short wools will soon cause them to degenerate, and we need only look at the average flock of so-called native sheep in order to be convinced that in the majority of instances the patience of nature even in the sheep has been exhausted. As to the next point, selection in breeding, it is a lamentable fact that inbreeding from inferior animals has been practised to such an extent that in many instances we are no longer able to see the marks of any distinct race of sheep. Nature always tends to revert to original types when left to herself, and the farmer who is not careful to select the best ewes and infuse new blood into his flock, from time to time, in the male, will be sure to see this reversion in his flock. I am convinced that this is the cause of degeneration in the flocks of long wooled sheep in this vicinity.

Of the long-wooled sheep I shall speak of the three suited, in my opinion, for this locality: Leicesters, Lincolns, and Cotswolds, and of the mediums the downs.

In the Leicesters there are three distinct classes: The Bakewell, noted for its symmetry, and fineness of style, and early maturity, but it is too fine a sheep, and too closely bred for this section of country. The Yorkshire Leicester is a strong sheep, and while retaining in a marked degree the excellent qualities of the Bakewell, is larger, yields a heavier fleece, and matures nearly as soon. There is not much difference between the Border and the Yorkshire, only the Yorkshire retains its wool better. The Yorkshire may be known by the darker colored heads, being better filled up in the collar, and the neck never rising much above the shoulders, being almost on a line with the back. It is also a little fuller in the ribs; fore feet stand wide apart with wool down to the knee.

Mr. Parkinson, of Ontario, says: "About two years ago my flock averaged a little over eight pounds of wool to the fleece. I do not think that the wool of breeding ewes increases in weight after they have lambed, while the wool of young sheep does. I have had shearings average ten pounds a fleece."

There is not a great deal of difference between the Lincoln and Yorkshire Leicester. They are a hardier sheep, and retain their wool better, yielding as aged sheep a better fleece, of about the same quality of wool. Mr. Geary, of London, Ont., says of them: "Of sheep, I prefer breeding pure Lincolns, as I think they are better adapted to this country than either the Cotswold or the Leicester. They retain their wool much better than the Leicesters, and the demand for it is just as good. I have imported from England a large number of Lincolns, with a view to their wool, to their quality as mutton sheep, and their general adaptability to this country. They are a very hardy and easily kept sheep." My brother bred pure Lincolns, and was better pleased with them than any other sheep. His sheep were pure Lincolns, and were sold entirely to Ohio men for breeding purposes. The last lot of shearlings he had of twelve choice, an average of 11¼ pounds of wool was obtained, and of a shearling ram 17¾ pounds, the wool being even in fibre, of remarkably fine lustre, and some of it 17 inches long. He also bred Leicesters at the same time, but his preference was for Lincolns. The average yield of wool in flocks, however, will be found about the same as Leicesters, where the sheep are all young—about eight pounds.

The Cotswold is in some sections of country a favorite sheep, Mr. Stone, of Guelph, Ont., thinking as much of them probably as any other man in that country. They are characterized by the peculiar tuft of wool on the forehead, which, in full-bred sheep, hangs down between the eyes, covering the face; by their curly wool heavily set on the neck and shoulders; not as full in the ribs as the Leicesters. They grow to about the same size as the Leicesters, but do not mature as early; are a little coarser in mutton, as well as in wool. The average wool weight is about the same, but they do not retain their wool as well, and on that account, in the western part of Ontario, few of them are bred at the present time. The great demand for Cotswold sheep in Ontario has been from American buyers, especially from Kentucky.

Of the medium wools, or the downs, I think that none will be as profitable to handle as the Oxford or Hampshire downs. As to the two classes, there is not much preference. They mature early, are strong, active sheep, and their mutton brings in England a penny a pound more than the long-wooled sheep. Their wool is better adapted to the manufacture of domestic goods, such as the imitation of tweeds which we make. I can do no better than read you an item which appeared in the Post and Tribune's agricultural columns, regarding the Oxfords. I believe there are none in this State, although quite a number of Canadians, seeing the probable demand for such sheep in the sheep regions of the far west, are breeding them:

OXFORD DOWN SHEEP.

This breed of sheep is of recent introduction in the United States, and is the latest addition to the mutton breeds which has been produced in England. The beginning of the construction of this breed was about 1830, with the idea of producing a breed that should possess the weight of the long wool with the quantity of the down.

The chief material used was the Cotswold ram and the Hampshire down ewes, which by judicious blending and careful selection, in a few years resulted in a distinct breed, although for many years after the breed had been recognized as distinct the want of uniform character was a source of criticism. The plan of breeding was, after the cross to breed the cross bred rams and ewes together and the result is a class of sheep, which, under suitable conditions, are profitable on account of size, weight of fleece, aptitude to fatten, strong constitution, and valuable meat.

It was not till 1850 that they were styled the Oxford down, the county of Oxford being the home of the principal breeders. Previous to this they were called cross-breeds.

The Royal Agricultural Society decided on a separate class, and the Oxfords first appeared as a recognized breed at the exhibition of that society in 1862, yet the judges complained of a want of uniformity, but by 1870 reports speak in praise of their general excellence, and improvement in uniform character; and there is still occasionally a difference in type, an individual having the more open fleece of the Cotswold or compact form and shorter fleece of the down. At the Smithfield club show in 1862, they took the champion prize as the best pen of sheep in any of the classes.

A real Oxford down has a head much like a Cotswold, with a tuft on the forehead, face and legs of a dark color, not gray nor black, resembling the Southdown; a well-formed body on short legs, and a fleece of long wool, thick on the skin and not too curly. The mutton when young is of the best quality, equaling the Southdown, and they make remarkable weights at an early age. In England they are made to weigh 140 pounds at 12 months, and such mutton is in great demand in the London markets. The cross with the Hampshire ewe for early fat lambs is also in favor. The following figures from the Smithfield Club show catalogue give the live weight of a pen of three sheep at 22 months, in 1870, 895 pounds; in 1871, 832 pounds. Pen of three aged ewes in 1870, 950 pounds; these sheep were of course fat.

Rams have been known to cut as much as twenty pounds of wool when shearlings, and whole flocks well cared for have averaged nine to twelve pounds. The wool though not so long as the Cotswold or Leicester is still classed as long wool, and is of a class in demand for the manufacture of worsted.

The Oxfordshire sheep stand close stocking and confinement. In England they can be kept entirely in hurdles, and are said to do even better in this way than if allowed a large range. They also do well on wet soils, and stand winter exposure well. Like all mutton breeds they require good care and heavy feed to make them their best, and in such instances give adequate returns.

Their great weight and early maturity has been attained by excellent care and feeding as well as judicious selection and intelligent crossing. They have been imported to some extent into the United States and have sustained their reputation on the other side of the Atlantic. On rich soils, or where feed is abundant, they will give a great weight of mutton at an early age. We are not aware that there are any in this State.

The Southdowns are too light of wool to ever become very popular in this country, although they are the best mutton in the world. Lincolns and Leicesters can easily be brought to 100 or 120 pounds dressed at one year old (for mutton). Sheep in order to do well, especially long-wooled sheep, should never be kept in close houses. They should have a good airy shed into which they can go in stormy weather; not too close, because the moisture from their breaths is all absorbed by the wool, and proves injurious. I think in almost every instance the instinct of the animal is the best guide, and they will seek shelter as the storm comes on.

As to profits of sheep raising, I will give you the figures of the Agricultural Commission of Ontario, where the estimate is made for mutton, and where the price is put at a minimum. Take a shearling wether:

Weight 160 pounds, at 5½ cents per pound	$8 80	
Wool 7 pounds, at 35 cents per pound	2 45	
		$11 25
Value of manure when fed on turnips		75
Total value		$12 00

Cost.

Proportion of sire's services	$ 50	
Mother's keeping during milk	2 25	
Extra food from March to October	1 15	
Grazing	20	
Winter keeping	2 25	
Washing and clipping	10	
Proportion of casualties, etc.	1 00	
		$7 45
Profit		$4 55
		75
		$3 80

But the aim of Michigan farmers should not be alone the raising of sheep for mutton, but also to supply the demand for large sheep in the west to cross the stock already in the ranches there, and by breeding the right stock we could get the trade that is almost exclusively managed by Ontario to-day. Well-bred ewe lambs of either the Leicester or Lincoln type will average nine doldollars to twenty dollars for the farmer in the fall, and I do not know of anything that will pay better.

DISCUSSION.

Secretary R. G. Baird believed that some of the Michigan flocks were as good as any in the world, and cited the case of an ewe of Mr. A. D. Taylor's that gave a fleece weighing twenty-seven pounds.

Mr. Porter thought that the figures in Judge Stickney's paper were much too high. If the people present could be made to believe that such figures could be realized in practice, all would go at it. He believed in in-and-in breeding.

Messrs. Blow, Hemingway, and Calkins heartily supported the sentiments expressed by Mr. Porter.

Mr. Norton, of Oakland, thought that mutton was an object as much as wool, and for that purpose there was no sheep equal to grade fine wools or of coarse wool sheep. The coarse wools are more hardy, and considering the care they are likely to get, are better adapted to the ordinary farmer.

Mr. C. T. Dean thought that wool was the prime object, and that fine wool sheep were as good for mutton as coarse wool.

Mr. Norton said he believed in fine wool; he had a stock of 130 such sheep that for several years had sheared an average of eight to nine pounds per head. He thought, however, that the fine wool sheep were more likely to have the foot-rot than coarse wools. A large price acts in the same way as an advertisement, and for that reason alone it pays to get high priced sheep.

Prof. Johnson emphasized the weeding-out process as the most likely to improve any flock.

DRAINAGE.

BY HON. JOHN T. RICH.

[Read at Lapeer Institute.]

The subject of drainage is one of the most important which demands the attention of the farmer of the present day. Not only is it desirable and profitable, but with the use of improved farm machinery, the modern plan of rotation of crops, and the generally adopted plan of mixed husbandry, it is absolutely indispensable to successful farming. The advantages of drainage are numerous, and may perhaps be considered as well understood. Yet, until within a very short time, they have certainly not been appreciated in this vicinity.

One of the first advantages to be noticed in a drained field is the difference in the time in which it becomes fit to work in the spring. How often it is that a large field is all in condition to work except an acre or two, and the wet part bears such a relation to the dry that it is impossible to properly work the dry until the wet portion is dry enough to plow, often causing the loss of time enough, in the first instance, to have permitted the field to have been nearly or quite ready for sowing, had the land been properly drained. And it frequently happens that before the wet part has become sufficiently dry to work, rain again falls, and the delay is repeated, causing loss enough in some seasons in a single year to pay for the drainage twice.

Even if the wet part of a field is in such shape as to permit the dry to be worked separately, the actual expense of working the dry part is almost always greater than to work the whole if it was all dry. Take next the convenience of drawing loads across the drained ground, over that which has not been drained; the extra labor for both men and teams in working the wet, muddy land, the difference in the condition of the same ground when dry—the first hard, lumpy, full of cracks; the other rich, mellow, and in such condition as to make it a positive pleasure to plow it, and the difference is beyond description. Then the difference between a field on which is growing an even, full crop on its entire surface, and one which is either naked, or what is worse, growing up to weeds, and a strong additional argument in favor of drainage is presented.

But over and above all this, which some may say is overdrawn, is the actual difference in the amount raised. In working a ten acre field it makes a great difference in the returns whether you have a crop from eight and one-half or nine acres or the full ten acres. It is a greater difference than men engaged in any other business than farming would permit at all, and it is greater than any intelligent farmer will permit when it can be so easily avoided. One-tenth or more of your income from the field gone, and a larger outlay for cultivation than if properly drained, often causing the loss in a single year of a larger amount than would have been expended to have properly drained the field, and which if properly put in would have lasted for twenty years at least, and would have saved an amount equal to the original outlay, each year, for fifteen out of the twenty years.

There is no doubt that on most lands where no draining has been done, that a large amount can be done, which when all the advantages to be gained are taken into consideration, will pay every year an amount equal to the first cost of the drain. After that which is needed most is completed, there will be much more to do that will not make so large a return, but still sufficiently large to make it a better investment than almost any use to which a farmer can put his money. Some men say this is all well enough for those who are out of debt and can afford it, but that a man in debt can not do such things. The reverse, however, is true. If a man is out of debt and has some other sources of income, he can drain or not, as he may elect; but a man who is in debt and has no income from other sources, must either drain or it is only a question of time when he will be financially ruined. No legitimate business will stand an annual loss of from ten to twenty per cent., and at an increased cost of production for the want of an outlay, which compared with the results, is so insignificant. While manufacturers are figuring the cost of production down to a small fraction of one per cent, farmers can not afford to follow a system which entails a loss of from one-tenth to one-fourth of the gross receipts. Some think they can not afford to drain. They look over their farm and in estimating the cost are frightened at the amount it is going to take to properly drain the farm; but it is not necessary to make the outlay all in one year nor in two, though the faster it is done the better. Begin with one field where it needs it most put in well, and in accoradnce with a well-matured plan for all the drains which will be likely to be in any way connected with it. Keep account of the cost; measure as accurately as possible the amount of land reclaimed, and of the increased production of the field; the time saved in getting to work on the land; the difference in the expense of working the field as a whole compared with working it without the drainage; the reduced expense of avoiding the necessity of working surface drains and the reduced expense at which your crops can be harvested, and if you will set this amount aside as a drainage fund you will find that it will be large enough to more than do an equal amount the next year, and the same process can be followed for each succeeding year until all is accomplished, and until the most incredulous will become convinced of the wisdom and profitableness of the investment. Another advantage not yet mentioned when taken in connection with the drainage of marshes and places where water stands for a portion of the year, especially in the vicinity of the house, which is very important, is the reduction of malarial diseases, and which, if the system becomes general, has a very marked effect upon the general health of the people. The ease with which drain tile can be procured and the reasonable price at which it is sold, removes the last serious difficulty in the way of farmers draining their farms economically and well. It often happens that a farmer is delayed for a few days by wet weather, and then is a good time to make a drain in some place needing it. The ground is soft, and the water running in the ditch is of great assistance in leveling the bottom. It is not unusual for a farmer to find a job of this kind very beneficial and at a trifling cost, as the labor used in digging and filling of the ditch would have accomplished very little elsewhere during the wet weather.

Draining, like anything else that is worth doing at all, is worth doing well. The tile should be buried not less than a foot and a half, and unless the shape of the ground makes it necessary there is nothing gained by burying more than three feet deep. In order to get the full benefit of the tile care should be taken to have the ends of the tile meet evenly and exactly, and for the same reason depressions and elevations in the bottom of the ditch should be carefully avoided. It is always desirable to have considerable fall in the ditch, and the greater the fall the smaller the tile may be used to carry the same amount of water. A long level can, however, be made to work successfully, provided there is considerable fall towards the upper end of the ditch. Drains carefully put in where there is very little fall will do a great amount of good, though never entirely satisfactory. In closing, let me repeat that thorough, systematic drainage is indispensable to successful farming in the future.

UNDER DRAINING.

BY JOHN PRESTON.

[Read at Berlin Institute.]

The necessity of removing the surplus accumulations of water on retentive clay soils by means of subterraneous channels, is so well understood by most farmers, that I deem it not necessary to spend much time to prove facts. What we need most is a better knowledge diffused among farmers and laborers of the best methods of constructing permanent drains, and to cheapen their cost. The farm is the farmer's capital, and the income his interest. And any improvement that tends to increase the value of income above interest on the cost of such improvement, without depreciating the value of the farm, is the farmer's clear gain. The long and continued process of cropping is beginning to show its deteriorating effect on the leaf-mould soil that was formed in past ages.

The soil on the more elevated portions of the farms is noticably dryer, lighter in color, and partaking more of the nature of the subsoil, and showing signs of barrenness. While the soil on the lower and wet portions of the farms may hold its dark color, its fertility is often rendered unavailable by frequent stirring and poaching while in a wet condition. We are therefore forced to the conclusion that in many instances the soil is less even and less fertile than when first cultivated, and that better management of the farms is necessary, if we perform our duty and hand down to our posterity the soil in as fertile a condition as we received it. To obviate these difficulties, a thorough under-drainage is indispensable. Its effect is to remove surplus water, distribute a more even temperature of heat and moisture, to largely prevent washing, and to lengthen the season for labor and for the growing crops.

To make under draining a complete success, a systematic plan must be adopted to suit the conditions of soil, lay of land, and surrounding circumstances. And as the soil and lay of land vary widely, no definite plan can be laid down in detail to fit every farm alike; therefore, to remedy this difficulty, general principles must be applied, leaving the details to be carried out according to circumstances. After having decided upon a plan for a thorough system of under-drainage, it will be seen that the work can be divided, and a portion of the work done at such time as will best suit the farmer's convenience.

GENERAL PLAN.

The main channels of the drains should be laid and extended through the lower portions of the farm, running as direct to the outlet as practicable. By taking the shorter cuts with the main drains it will be seen that a greater quantity of water can be discharged in a given time, and the cost of laying the drain is less, as less large and expensive tiles are required. The lateral drains should be laid in sufficient number to make the work thorough, although it is not necessary to complete the whole job at one time. The main drains should be laid first, and the laterals may be laid or postponed, as will best suit the farmer's convenience.

The depth to lay tiles should be governed by circumstances. On ordinary clay soils from three to four feet deep is considered to be about right. The main drains should be on a lower line than the laterals, and the mouth of the laterals at their junction with the main drain, should be slightly turned down stream, to prevent their obstruction with floating silt in the main drain, and by laying the top of the cavity of the laterals on line with the top of cavity of the main drain would give sufficient fall to force back into the main drain any substance that may have been forced into the laterals during a high pressure of water in the main drain.

MANNER OF DETERMINING SLOPE.

On ordinary rolling land where there is one or more inches fall to the rod, the slope in the bottom of the ditch may be made by means of a curved blade spade, in the hands of a good workman, and an even grade determined by the trickling stream of water that is usually found in clay soils when they are wet enough to make ditch cutting profitable. But in the absence of water in the ditch, or on very level lands, a survey will be found to be necessary to insure accuracy.

MANNER OF LAYING TILES.

After the bottom of the ditch has been graded with as true a slope as the surface of the land will well allow, and leaving no sags for the water to stand in, the tiles may be placed on the side of the ditch in reach of the workman, who stands in the ditch and begins to lay the tiles at the upper end of the ditch, carefully plugging up the upper end of the first tile with a stone, or some hard substance that may not rot, or be displaced, to allow water and mud to pour in at the end of the drain. The workman should be provided with an implement in the form of a trowel or spade, with a concave blade, to cut a cavity in the bottom of the ditch to exactly fit the tiles that are being laid. The channel should be cut deep enough to firmly embed the tiles in their places. And with the same implement the workman may rim the inside corners of the tiles, and remove the ragged edge that is objectionable. He will then proceed with his work, backing down stream, cutting the trench and laying the slight curve that is usually found in tiles, on the side, and reversing the next at the other side; this gives a good fit at the ends of the tiles, and leaves the bottom level. Where the joints do not make a perfect fit, a covering of white oak or cedar shavings, or tarred paper, may be used to prevent dirt from washing into the joints.

The soil should then be firmly packed around the tiles, using the subsoil first. The packing of the soil a foot or two over the tiles should be thorough, but never done when the soil is in a wet condition. Covering tiles with straw and loosely shoveling in the soil until the ditch is full, I find by experience, to be very objectionable, as the straw will soon decay, leaving fine particles to wash into the drain, and leaving a channel at the sides of the drain for the mice and water to make havoc with the tile bed.

There are many things in a general way, or in detail, concerning under draining that perhaps might have been more profitably mentioned here, but if what has been said provokes discussion, and draws out any information, or stimulates action in the way of under-draining, this hastily written article will not have been written in vain.

FARM DRAINAGE.

BY S. B. CANNON.

[Read at Armada Institute.]

Mr. President, Ladies and Gentlemen: Doubtless there is no subject that will be discussed at this Institute that is of more vital importance to the agricultural interests of this county, than the subject assigned us to open a discussion upon, viz.: "Farm Drainage." And we only regret that the duty of opening the discussion had not been assigned to some individual of larger experience.

Our county lies in a belt of country where the rainfall amounts to about forty inches during eight months of that portion of the year when we have more or less rain, viz.: March, April, May, June, July, August, September, October, and November.

The majority of the lands in this county are what would be termed level or flat surface, with streams and ravines sufficiently numerous to carry off the water from excessive rainfalls or melting snows, still sufficiently flat to retain a vast amount of water until it is taken up by the slow process of evaporation. Now if this rainfall could, by any definite law of exactness, be so distributed in quantity and time as to meet the necessities of the case for the time being, there might be less necessity for artificial drainage; but the opposite are the facts, so the only thing for the successful agriculturist to do is, like a good general in the army, prepare for the emergency while he may.

In scientific research, or ancient or modern experience, nothing has been found so effectual as artificial drainage in some form or other. The soils of this county are quite variable in their surface texture, but the substrata is almost universally clay, and whatever the surface developments are, they usually hang out their sign of distress when they are, in nautical parlance, water-logged, by a stinted growth of water weeds, or wild or water grass; or in time of drouth, by a shriveled and gaping surface, often in a stiff clay soil, opening cracks sufficiently broad for small animals to fall into.

These defects in nature are largely remedied by what we call artificial drainage. Drainage may be and is performed in various manners, with more or less success. On the level prairies of the west, where the grade and fall are uniform, drainage is quite successfully performed with what is called a drain or mould plow, so constructed that with sufficient force it can be drawn through the earth at a depth of two feet, more or less, leaving a perforation of two to three inches for the escape of surplus water, which is said to do quite good work for several years. It is also practiced in some localities by the use of the common plow or spade, or both, in opening up a trench which is filled partly full of small stones or brush, or both, as the case may be, and then covered by returning the earth originally thrown out. Such drains, when proper care has been taken to have a continuous fall with a good outlet, have been known to do effectual work for quite a term of years, sufficiently long at least to amply pay for the cost of construction, for we assume that such drains will not be constructed except where small stone are found plenty, and then the drainer realizes a double profit by making a drain and getting rid of the stone.

They may also be constructed in another manner quite cheaply where timber is plenty, by digging the trench to within six inches of the required depth, sixteen inches wide, taking the last spading out of the center of the trench, leaving a shoulder of five inches on each side, which can be covered with shakes or shingles split for the purpose and laid crosswise over the last opening, and then covered over or re-filled by returning the dirt originally thrown out.

But by far the most practical system of drainage, in our opinion, is that performed by the use of tiles made from the very soil most needing their extensive use. Having had some experience in the manufacture of tile, I think I can safely recommend them for general use when properly manufactured. There are drains in my neighborhood that were constructed twenty years ago by using horse-shoe drain tiles of my manufacture that are doing even more effectual work than when first constructed.

The cost of draining an acre of land rod for rod with horse-shoe tile or round or sole tile will vary but little, as the digging and covering would be the same in either case; the final results might be different. It is our opinion that a drain made of horse-shoe tile will absorb and get rid of a given quantity of water quicker than any other kind; but it is claimed by those having used the other kinds, namely, round and sole tiles extensively, that they take the water quick enough to effectually relieve the soil of all surplus water within their reach. The cost of draining an acre of land must depend upon the kind and condition of the soil, and the depth of the drain, very stiff clay requiring drains to be more frequent than more open or porous soils; but for ordinary practical farming purposes where the soil may be relieved soon enough to avoid injuring any ordinary crop, allow me to read an extract from a paper on drainage, taken from the report of the Michigan Board of Agriculture, for the year 1877. From the tables for rainfall we see that showers exceeding one inch are rare, but that about one-fourth of our rain falls in these heavy showers. From that it is safe to conclude that if the drains are capable of conveying away the water that reaches them during the next 24 hours after a rainfall of one inch, little or no surface water will remain on the land during any portion of the year. The amount of discharge as compared with the rainfall depends upon so many conditions that it cannot be accurately stated, but probably will seldom or never exceed fifty per cent of the rainfall during the next 24 hours under any conditions.

One inch of rainfall produces 3.630 cubic feet per acre, consequently our drains, to produce under all conditions thorough drainage, should be able to convey 1,815 cubic feet of water for each acre drained.

Now I am assuming the proposition that we drain the land thorough enough to defend ourselves against any loss on the above theory of rainfall on flat clay loam lands, the kind predominating in our county. We will take for convenience of illustration a field of ten acres, forty rods square. We assume that one main drain of four inch tiles will carry off all the water of such a rainfall as we have described if it can be reached before any injury can obtain to any vegetation commonly cultivated by the farmer.

We further assume that lateral drains constructed of two inch tiles and laid in such a manner as to properly discharge themselves in the main drain once in four rods will furnish such an escape.

Now if this theory is true, the cost of draining ten acres would be as follows, at the present price of tiles and labor:

Forty rods 4-inch tile 30 cents per rod at factory	$12 00
Four hundred rods 2-inch tile, 15 cents per rod at factory	60 00
Digging and covering 440 rods at 20 cents	88 00
Drawing tile from factory and boarding help to do work	20 00
Total	$180 00

Which would be, as you will see, an average of $18.00 per acre. The investment of so much per acre at first thought, Mr. President, seems to be great; but I firmly believe that the farmer that fails to make it where the necessities require it, renders the possibilities of a uniformly good crop an impossibility. The average price of the lands of Macomb county as equalized by the Board of Supervisors for the year 1881 were a fraction over $35.00 per acre. Add to this our estimate of the cost of draining and we increase the cost of the lands to $53.00 per acre, but we increase their absolute agricultural value, making them worth nearer $70.00 per acre for practical use.

It is no uncommon thing for farms at the present time in this county to change hands at prices ranging from $50.00 to $70.00 per acre, but you will invariably find that nature has made a happy provision for ridding them of these surplus waters, or that man has supplied the deficiency by artificial drainage.

So that considered from that standpoint, the investment is a safe and profitable one, sure to return the original investment with an increased value of at least 25 per cent if you wish to sell. It also makes the possibility of uniformly good crops so certain that it is a gain on the investment of at least 50 per cent in that respect, in my estimation.

We do not wish to be understood, Mr. President, as ignoring the great benefits arising from that element so necessary to vegetable growth, and to our existence; but we wish so to control it as to receive its greatest benefits at all times, and as an illustration of our idea of the benefits to be received, permit us to read an extract from Walter Bligh's rationale of thorough drainage in 1650.

"The goodness of the water is as it were, riddled, screened, and strained out into the land, leaving the richness, and the leanness sliding away from it. The benefits of drainage are stated thus: 1. The cold and sour standing water, which drowns vegetation and packs the soil, is filtered through. 2. By this filtering the manurial portions of the water are left in the soil. 3. The soil being thus opened the aerial gases, especially oxygen, enter it and decompose the organic matters so that they can be taken up by and nourish the plants. 4. By lessening the evaporation and opening the soil to admit the air and warm rains (in place of cold standing water), the temperature of the land is raised. 5. It equalizes the temperature and prevents sudden changes of heat and cold. 6. It renders the soil drier and warmer earlier in the spring and later in the fall, thus greatly prolonging the planting and growing season. 7. In dry seasons the soil is moistened by condensation from the air admitted into it not only from above, but also from the drains beneath. 8. The soil thus made more open and mellow, roots penetrate farther, and get more nutriment. 9. The open, dry soil absorbs miasmatic gases, which enrich the soil and purify the air, thus increasing wealth and health; foot rot, and other diseases of animals, decrease on drained lands. 10. Grasses improve in kinds, quantity, and quality; the finer and richer supersede the coarse, sour kinds; the greenness is made more enduring as the season of growth is prolonged."

Emerson's playful argument is quoted: "By drainage we have gone to the sub-soil, and we have a Concord under Concord, a Middlesex under Middlesex, and a basement story of Macomb county more valuable than all the superstructure."

Tiles are political economists; they are so many young Americas announcing a better era,—a day of fat things.

FARM DRAINAGE.

BY HIRAM ANDREWS, OF ORION.

[Read at Farmington Institute.]

MR. PRESIDENT, LADIES AND GENTLEMEN: The question of drainage, or of finding some method to dispose of the surplus or stagnant water, that accumulates on a large portion of our agricultural lands, is one that has attracted the attention of the agriculturist for centuries; one upon which a large amount of money and labor has been expended; one upon which various plans and theories have been experimented—on some with success—others have proved a failure. The fact that it is necessary to dispose of the stagnant water, in order to assist the early growth of vegetation, has become so well established, that it is not necessary to enter into an argument to prove it. Nature has provided a general system of drainage, through her rivers, creeks, rivulets, ravines, and the rolling and uneven surface of the earth, by which the larger portion of surplus water, which may accumulate from heavy storms, finds its way back to the ocean. Yet it is an established fact, that after the various means supplied by nature for disposing of the surplus water have been exhausted, there yet remains a large portion of our agricultural lands, which, either from the nature of the soil, or the land lying so level, or other causes, that are too much saturated with water for the growth of vegetation, and which require some method of artificial drainage to make these lands remunerative to the agriculturist.

There is a certain amount of moisture necessary to the early growth and maturing of vegetation. When lands retain beyond that amount, they become cold and sour, and seeds will not germinate and grow. The quicker and more thoroughly you can dispose of the surplus water, the sooner your seeds will grow and mature. You can not under-drain land so much that there will not be moisture enough left in the soil for the growth of vegetation. If you should take a quantity of dirt and place it on a wire sieve, or screen, and thoroughly saturate it with water, then let it drain all it will, it will then be in just the right stage of moisture to receive the seed. Land becomes too dry from evaporation caused by the heat of the sun. You can not make land too dry by under-draining; on the contrary, land that is well pulverized and thoroughly under-drained, will hold sufficient moisture for the growth of vegetation much longer than where the water is allowed to stand until it evaporates.

From the above facts we learn that it is of the greatest importance to remove, by some artificial means, the surplus water as quickly and thoroughly as possible; and, also, I want to impress upon all farmers the importance of thorough cultivation, the necessity of often stirring the soil, and keeping it well pulverized, thereby assisting nature to retain moisture in the soil. The best method of disposing of this surplus water must largely depend on circumstances. In some instances an open ditch might be best, but it is generally conceded that a system of under-draining, or of blind ditching, is more preferable. The amount of ditch necessary to drain land must largely depend on the nature of the soil of the land to be drained. Some clay soils might require a ditch every two rods; in other soils a single ditch might drain a field of five acres or more. Ditches should be near enough together to drain the land thoroughly, and of about three feet in depth, and where it can be obtained, round tile from three to six inches in diameter should be used for the water course; boards and stone are frequently used, but are not as durable. Boards will soon decay, and stone cannot be so laid but that in a few years they will fill with dirt and require taking up. A very little fall will carry off the water, or even a dead level with a good outlet will drain land. Yet, it is of the utmost importance that the bottom of the ditch be made on a true line, with no dips or sags for sand and dirt to collect in. With the right kind of tools a ditch may be made about sixteen inches at top, and just wide enough at bottom to receive the tile. The tile should be laid straight, and joints kept as perfect as possible, so that dirt will not work in. Fill in ditch about six inches with any soil but sand, and pack it thoroughly around the tile, then the ditch may be filled in any manner that it can be done with the least expense.

I have put in about two hundred rods of tile the past year; about seventy of it was to drain low places in a heavy, gravelly clay soil. The tile was laid from two and a half to four feet deep, and it has thoroughly drained the land. The balance was laid to drain a marsh of about two acres. I had to make an outlet of about twenty rods from two and a half to five feet deep, then I run a ditch about three feet deep around the marsh near enough to the edge to secure a hard bottom for the tile. It has drained all the lower part of the marsh thoroughly, but in going around the head of the marsh for about fifteen rods, I found a sort of quicksand, of such a nature that it would not cave while digging, but soon after the air and water struck it it would dissolve and cave in. About two feet deep the water oozed out slowly all around the head of the marsh, and when I laid the tile and filled the ditch with the dirt that came out, it would pack so that the water could not get into the tile. The water would come to the surface. I have laid three courses of tile within a rod of each other, yet it is not well drained.

I would like the experience of different individuals in draining soils of that nature. In nearly all kinds of soil water will find the tile. I have tile that has been laid ten years that does its work as well now as when it was first put down.

In draining marsh or quicksand, it will require boards to be first laid in the bottom of the ditch, then lay the tile on the boards, otherwise the tile will settle out of line and soon fill with dirt and stop the water course.

In draining marshes, or more particularly what is termed cat holes, there cannot be too much care taken in securing a good outlet and a heavy fall just where your ditch strikes the mucky bottom between the marsh and hard land, as this mucky land, of which most of the marshes are composed, will settle when thoroughly drained, more or less, sometimes even as much as a foot, thereby throwing the tile out of line and opening the joints so that they quickly fill with dirt, and the drain will not carry off the water. I prefer where it is practicable to ditch around a marsh just far enough into it to secure a hard bottom to receive the tile. In most of the marshes or cat holes the water comes from springs located around the outer edge of them, and this ditching around cuts the water off at its head. But in some instances we find springs in the center of low, wet lands; in that case it will require a ditch direct to the spring, or to the source from where the water comes to the surface. In draining clay lands or other soils where there is a good, hard bottom for the ditch you do not have to guard so much against the tile settling out of place. First secure a good outlet, then make the bottom of the ditch on a true line with the incline or fall that you have. Dig the ditch not less than three feet deep and put them near enough together to thoroughly drain the land, and if good tile is used, properly laid, and ditch well filled, it will do its work for a long term of years. I have given a few general principles on drainage which may be practicably applied in underdraining land, but there is such a diversity of soils and of marshes, and the lay and situation of the lands to be drained, and the material that can be best obtained, that it is impossible to adopt a system of drainage that will apply to all sections, localities, and to the different soils.

The best method to ascertain the most practical, economical, and thorough system of drainage is through organization and coöperation by the farmers and agriculturists in forming agricultural societies, farmers' institutes, farmers' clubs, and thorough organization in the Grange. Through these different organizations discussions will bring out new ideas. A general interchange of thought, of experiments and experiences will be had, from which new thoughts and ideas will spring into existence. Practical knowledge and information disseminated among the farmers in this way will be of tenfold more value and accomplish more towards reclaiming the unproductive lands of Michigan than the best treatise written on drainage. It is this general dissemination of knowledge by association and coöperation which will do more to educate and elevate the farmer than can be done in any other way. Some system by which the farmers can receive and obtain a thorough and practical education in his relation to agriculture is what the farmers most need. There is no branch of industry that would receive more benefit from education than farming; I do not mean that kind of college education which teaches students that manual labor is degrading and dishonorable. I mean that kind of education which teaches our sons and daughters that the labor which is necessary to be performed in tilling the soil to produce agricultural products is the most honorable and desirable. The farmer should be so educated that he will understand the chemical composition of the soil he cultivates; the different properties it contains, and what ingredients the soil should contain to produce the different kinds of grain. Education should assist the farmer to perform the work necessary to be done with more economy and less labor. The more education the farmer can get the better, if it does not make him feel that the more he has the better he can live without labor. He wants to feel that education is necessary to fit him to more intelligently and successfully perform labor.

It requires practical knowledge and experience to be successful in draining land; this can be had by reading and studying different authors on drainage, by association and coöperation, by a general interchange of thoughts and ideas, and by practical experience.

I am satisfied, and in fact it is universally conceded by those who have had experience, that money invested in draining land will return a larger per cent than any other investment. I wish to impress more deeply upon the minds of the farmers the importance of a thorough system of drainage and thorough and deep cultivation of their lands, and that lands, well drained and thoroughly pulverized, become warm and fit to receive the seed quicker than where water stands until it evaporates, and will retain that heat and warmth better; and also retains a sufficient amount of moisture for the growth of vegetation much longer than cold, wet land where the moisture is removed by evaporation.

With the limited time I have, even if I had the ability, I could not do justice to this subject. If I have presented a few crude thoughts that will bring out discussion and assist the farmer in bettering his condition, my purpose will be accomplished.

THE FARMER HIS OWN MECHANIC.

BY E. D. A. TRUE.

[Read at Armada Institute.]

In savage and uncivilized countries, or in civilized regions, when the people are poor and money scarce, as in the early history of our own country, or in the back-woods at the present time, each man does for himself nearly every kind of work, and division of labor is almost unknown. But when the resources of a country have been developed, as they are among us, a different state of things prevails with advantage to all. I shall not discuss the division of labor question—you are all acquainted with its merits. But why, in this age of advancement, when the farmer and the mechanic have so effectually divided operations, according to the most highly approved theories of political economy, —why stir up this ghost of primeval and savage times by discussing a topic like the present? Without doubt the committee who selected this subject for discussion, to-day, had some reason for so doing. Indeed, I think there is some excuse for it, myself. When a man with hundreds, or perhaps thousands of dollars, invested in tools and machinery, lives miles from a shop, and has no other conveniences for repairing than such as are furnished by a plow wrench, a log-chain, and an axe, there is good excuse for inquiry about it, at least.

The truth is, the farmer has not advanced to his present position, with reference to the carpenter, the blacksmith, and other tradesmen. He has simply stood still, while the mechanics have done the advancing; and they have advanced their bills into his pocket-book, from twenty-five to one hundred dollars a year beyond the proper limits. Everything else is advancing, but the farmer's shop stands still. His tools to-day are just about the same that his grandfather used when he built the log house.

Every farmer is to a certain extent a mechanic; namely, to the extent that he either invents, constructs, or repairs tools, buildings, or machinery, or masters the details of their construction or working. This every farmer is obliged to do, more or less, and to this extent he should have tools and a knowledge of their use. Machinery makes the farmer's business what it is to-day; machines are increasing and will increase. The stumps are scarcely out of the ground, but the number of complicated implements is great. When clearing has reached its limit, the stumps all gone, and the land leveled and under-drained, they will be doubled, both in number and in power. In a few years every first class farmer will have a steam engine, or some corresponding source of power, and many accessory machines. And the time is not far distant when he will find it almost necessary to hire a man at extra wages, who understands mechanical work, or he will have to become acquainted with it himself.

The struggle for preëminence is daily becoming more fierce in every line of business, and the call is loud for more intense and telling work. The coming farmer ought to be a Michael Angelo, and he must, at least, make the most of every opportunity to fit himself for handling his forces, and among these the shop should hold its place. If the middle aged man thinks himself too far gone to be benefited by increasing his accommodations in this line, he would still do well to give his boys a liberal chance. Most boys take readily to the shop for their own amusement, and there is scarcely a more powerful means of education outside the school room. The making of a toy wagon, or a wooden gun, at the age of eight, is worth more to a man than a book of geometry at twenty-five. It has been well said that tools make the mechanic. We might add with equal force, that a shop makes the tools. In fact, without some place corresponding to a shop, where they may be safely and conveniently kept and used, tools, though not useless, generally become nearly so.

On every farm where boys are growing up, or where the proprietor or superintendent has any taste or ability for mechanical work, or for employing his hired men in this way, there ought to be a wood shop, a blacksmith shop, and I might add harness shop. It is evident that a farmer cannot afford to furnish a shop so completely as one whose business is all done there. Judgment must be used in deciding whether to have these things at all, and to what extent.

What I dignify by the name of harness shop need not cost over one or two dollars; that is some awls and needles, ball of shoe thread, and some wax, a leather punch, and a few buckles and rings, and a box to keep them in. These, with a pair of clamps which a man will make in an hour, or still better, a sewing horse, and we have everything necessary.

The blacksmith shop is more expensive, and requires a separate building. I would not advise any one to put a forge into any other farm building,—the danger is too great. But a shanty-roofed building, ten feet square, with one side open, will answer the purpose, and need not cost more than five or ten dollars. A second-hand bellows will cost from three to five dollars, and with a forge, built in an old sugar barrel, a hammer, cold-chisel, punch, and pair of tongs, we have a shop in which we can heat a burning iron, straighten a bolt or rod, make a hole in any band, bar, hoop, or brace, put a head on a bolt, or straighten a sprung clevis without breaking it, and in fact, do almost any simple repairing. Of course I have described a very cheap and rather incomplete outfit, and one may do as much better as he chooses.

When I first added a blacksmith shop to my farm accommodations, I bought bellows, anvil, hammer, several pairs of tongs, and other tools, for only a little over five dollars, and placed them in a very small and inexpensive building. I am now putting up a shop sixteen by eighteen (16x18) to take the place of the old one, and would advise any one to build large, as the building will pay for itself as a storehouse if nothing more. Here everything in the iron line is naturally brought together—much is saved from actual loss, and much more that is practically lost is rendered valuable, by being brought together where it can be found when wanted.

The principal cost of the wood-shop is the building. This ought to be of generous size, to furnish room for several men to work together on rainy days (the time when most of the shop work should be done). Within reasonable limits the building will pay as a storehouse for small tools, lumber, boxes, and every such thing, which never fails to find a center there. One may put as much money as he chooses into carpenter's tools, but ten or fifteen dollars, carefully used, will furnish a good farmer's outfit, at least for a beginning. It may be urged that shop work distracts a farmer's attention from his other business. This is a fair objection. But the whole attention must be given to something, and if a man can on any occasion make more money in a shop han elsewhere, that is the place to claim his thought. In a wet season, when it is raining half the time, a farmer's attention is distracted by paying mechanics' bills, and also paying two or three men for sitting behind the stove, when they might be earning their wages and paying his blacksmith bills beside.

When the farmer undertakes the work of the carpenter, or any other mechanic, he works at a disadvantage, because it is not his principal business, and consequently he can not have the practice, nor afford the tools which one can who does nothing else. He must, therefore, have some overbalancing advantage, or he loses by the operation. This advantage he may find, in case of accident to any implement, while in use, especially in a hurrying time. The loss or breaking of a bolt, brace or nut, or a thread battered or worn, may cost a journey to the shop and several hours' delay, when with a forge at hand, the repairs might have been made in twenty minutes. The cost of a few trips to town, with a wagon and span of horses, will pay the interest on a fair sized shop.

I have heard it suggested that the farmer's tools are always in poor condition, and always getting lost,—not a bad sign, my friend; in fact the best kind of evidence that they are used and ought to used more. If they remained always bright and never strayed from their places, it would be a bad sign, indeed. The fact is tools are in demand on the farm if they are within reach. Perhaps the boss will tell you, when he finds something missing, that he loses more tools than the work amounts to. But put them within reach, and he soon forgets about it. When his work is waiting for want of an augur, or a chisel, he knows that it pays to use them, and he never hesitates to show it by his actions. If he would keep a better stock and use them more, he would learn to take proper care of them.

The farmer's shop is of course made only for occasional use, and though it be used much, it must be idle still more, and the interest on the investment will be relatively great when compared with the earnings. It is impossible to make an accurate estimate upon such uncertain and varying foundations as we have to reckon from in this case. But supposing the value of tools and shops to be anywhere from one hundred to three hundred dollars, it is evident that the cost of a few trips to town with a team, in a hurrying season, a few half days wasted waiting for work to be done, a few dollars in mechanics' bills saved, a few days of lost time (rainy days) turned to good account, and a few dollars in loss, wear, and breakage, on various tools, lumber, and materials, saved by means of proper storage, will easily drown the interest on the investment.

A shop and tools is equivalent to an accident insurance. Peter the Great once saved his life in a retreat by knowing how to shoe his horse. Not every man can turn mechanical skill to such signal advantage, but if he only saves a ten-dollar bill once in a while, in his retreat from poverty, it will be some satisfaction, and any one can do that. Every bit of knowledge or experience acquired, even not apparently in the line of one's business, is an advantage gained, and may some day result in great benefit to its possessor. It is like the apparently useless researches in science, which are often ridiculed by the ignorant, as foolish and impertinent, but frequently resulting, as has been strikingly illustrated within the last few years, in such triumphs as the telephone, and the electric light. How much more certain must the farmer be to receive benefit from any skill or knowledge gained in a line so closely connected with his own.

The farmer's business is exceedingly diversified. There is frequent chance to apply the principles and processes of almost every trade, and mechanical profession, and there is room for endless contrivance in saving time and labor. If tools are at hand, they give a man scope in this direction. He may carry out his ideas and make experiments in leisure hours, and thus gain material advantage in his work, receive inspiration from success, learn wisdom from failure, and at the same time have change of work, which amounts to recreation. Almost every tradesman has tools, and methods of work peculiar to himself—inventions of his own, which suit his particular circumstances. Farmers have, to some extent—they ought to have them by the score—and the shop is the natural stepping stone to such helps.

If any one suggests that the shop work of the farmer will be of poor quality, I reply that there is plenty of work on the farm that can be done nearly as well by a farm hand as by any one, especially if good judgment is used in supervision, and selecting the right man for the job. For example, feeding boxes, watering troughs, bee-hives, whiffletrees and eveners, ladders, gates, and hay-racks. The blacksmith shop is most valuable as an accessory to the wood shop, and for repairing, but here one may make numerous things, such as staples and hooks, clevises, rings, a large spike for any peculiar place, a hog hook, cant hook, and many such things; at the same time using up old and otherwise useless pieces of iron, which are constantly accumulating.

The harness shop is of little use, except for repairing, and by taking a stitch in time save nine. A few stitches at the harness shop cost twenty-five cents, and this pays a farm hand for a quarter of a day. Every kind of shop work, as far as possible, should be done in advance. The farmer should not fail to have a list of jobs made out, to which he may refer at any time, and see what is to be done. This will save time, relieve the mind from needless tax, and often be the means of doing the proper thing, while one would otherwise pass it by for something of secondary importance. In my own experience, I find this very important. Sometimes I hire a man who has worked with a carpenter, or a blacksmith, at some time, and in such cases I take advantage of the circumstance to have work done in that particular line. When I find a man good at one job, I let him work at it as much as possible, and in this way have work done a year or two ahead. If one keeps plenty of men and keeps work done in advance, he can often take advantage of circumstances in this way, with great benefit.

I have said that every farmer, of any importance, needs shop and tools. This is a very general rule, and I do not say that it has no exceptions. I do say that they are few. I do not say that any farmer ought to get out timber this winter ready to build a shop in the spring, or that he ought to build or stock up with mechanics' tools, this year, or any particular year. I do say that his business is not simply agricultural, but that it is just as truly mechanical, to a certain extent, and that as a business man, he ought to be aware of this fact. Give it its proper place, and furnish himself with the means of carrying on this part of his business. That there is plenty of mechanical work on the farm which the farmer or his hired help are capable of doing, and much time which will otherwise be lost in which he or his men may earn good wages at such work. That a shop and tools are a valuable accident insurance, and that from their use a man gains ability in adapting the machinery and other conveniences of the farm to their work that he can gain from no other source, and that only when he recognizes these facts can he reach the limits of his possibilities as a farmer.

FARM IMPLEMENTS AND THEIR CARE.

BY H. MARHOFF.

[Read at Galesburg Institute.]

Mr. President, Members of the Kalamazoo County Husbandman's Club, Ladies and Gentlemen: I have not supposed that I was honored with this appointment because I was likely to say anything which has not been said, and better said, long ago. But if on the other hand I am expected to say something that shall throw some light upon the important subject of "Farm Implements and their Care," or shall say something that will bring out a discussion that will throw some light upon the subject, then I have not misconceived the design of this honorable organization, and may hope in some humble degree to further its work.

When the merchant is about to enter into trade, he takes time to carefully prepare a list of articles that he wishes to deal in, and then go to some large city and carefully select them, first looking well for the place where he can purchase them most cheaply, and being careful not to purchase any article on which he does not think he can make at least a reasonable profit.

When the manufacturer is about to enter upon the manufacture of a certain article or articles, he considers well the kind, amount, and cost of the machinery that will be needed to successfully and profitably manufacture those articles.

Now, if it is all important for the merchant to look well to the articles that he purchases, simply that he may make his profits, and for the manufacturer to study well the machinery needed to successfully perform his work, of how much more importance is it that the farmer bestow time, labor, and care upon the purchase of his implements, both in kind and quality. And especially is this true in the day and age in which we live, when so much of our farm labor is performed with machinery; and then there are so many implements upon the market that are an infringement upon somebody's patent, or upon which some one besides the manufacturer or seller holds the exclusive right, and in time will come around and assert his right, or pretended right, and demand a royalty, many times equal to or exceeding the actual cost of manufacturing the article.

In preparing a paper upon "Farm Implements and their Care," my first thought was, What constitutes such implements? In looking around the average farm we find many implements used to carry on the work of the farm successfully. Let us suppose, Mr. President, that you was just about to enter upon the avocation of farming for the first time, and was obliged to purchase an entire new outfit. As a judicious man (for such I know you to be), I think that you would first look around and count the cost; for a wise man, when he is about to build, "first sitteth down and counteth the cost, whether he hath sufficient to finish it." So I know of no better way than to make out a bill of items, with cost of each; and in making this bill I shall endeavor not to be lavish, only enough to furnish a medium sized farm:

One wagon	$60 00
One sleigh	25 00
Two plows at $14 each	28 00
Two harrows at $12 each	24 00
One wheel cultivator	30 00
One gang plow	25 00
One grain drill	80 00
One mower	75 00
One harvester and binder	350 00
One wheel-rake	25 00
One fanning-mill	25 00
Shovels, hoes, forks, etc	13 00

In this bill you readily see that I have made no provisions for luxuries, such as covered carriages, trotting sulkies, swell-box cutters, etc., etc., and yet the total reaches the sum of $760.

I have not recommended any particular make or pattern of implements, for there are many that are good—yes, excellent; in fact, there are but few tools or implements found in the market at the present time that are of an inferior quality.

The intelligence of the farmers of this generation would make it very difficult to palm off goods of an inferior quality.

In addition to the above schedule I would recommend some other tools for the farmer that can afford them (and in fact some of them can hardly be dispensed with), such as horse hay fork and carrier, hay tedder, mounted spring tooth harrow, and on some kinds of soil a roller; and so I might go on enumerating one article after another, but I will leave the balance for you to fill. But with the implements in the above schedule a man can very successfully manage a medium-sized farm, with perhaps the inconvenience of troubling his neighbors occasionally by borrowing.

Now let us suppose that the implements are all bought and paid for. The next thing to be looked after is their care. And what shall that be? Some corner in the barn-yard for the fowls to roost upon; by the roadside; in the fence corner in the lot where it was last used, and perhaps will be needed again; or shall they be properly housed and cared for?

Many farmers spend hours and days in going from one dealer to another in trying to "Jew" them down a few cents or dollars on the price of their implements, and at the same time take no care or thought in trying to make them last when once purchased. I would not undervalue the importance of purchasing our implements just as cheaply as possible, but if we would spend as much time in caring for them as we spend in trying to get them a little cheaper, we would save more money by so doing.

Now let us make a little calculation and see what the interest would be upon the above list of articles at the legal rate of seven per cent per annum:

The interest upon $760 will be $53.20. Now suppose that we take that amount and invest it in lumber and nails, and by adding a little of the time spent on our streets, sitting on dry goods boxes, or in the stores discussing the good or bad qualities of our neighbors, or the probabilities of this or that political candidate or party, we can have a tool-house that will shelter the whole of them, and in so doing add about one-half to their durability, to say nothing of the pleasure of using a tool that is in proper condition to use when wanted. After having erected the proper tool-house it will avail nothing if the tools are not placed in it.

Immediately after using a tool it should be properly cleaned and stored away for future use. I do not know that I would recommend taking a plow to the tool-house every night unless it be a steel one used on prairie soil, but I would recommend that it be taken out of the ground and thoroughly cleaned and not left as two plows that I saw several years ago north of Marshall. They had been used for fall plowing, and undoubtedly when left standing in the furrow at night the users expected to use them again in the morning, but before the morning came Jack Frost had made it impossible to stir them; so the plows were left frozen fast in the furrows until there came a heavy rain, and as the plows were in a hollow the water nearly covered them, only the tops of the handles remaining above the ice the last time that I saw them, which was near spring. What condition do you think, Mr. President, they were in to commence spring plowing with? And I think that I could find plows in almost the same condition to-day within perhaps two or three miles of where we are assembled at this time. Mr. President, I believe that I can safely say that if you should start from where you are sitting and take a ride of ten miles in almost any direction, with your eyes open, you will find plows, harrows, cultivators, wagons, mowers, reapers, and in fact almost every conceivable kind of farm implement, standing with no walls but thin air, and no covering but the blue canopy of heaven to shelter them. Brother farmer, these things ought not so to be.

When the tax-gatherer comes around we are apt to think that the burden of taxes is very grievious and hard to bear; and yet I believe the farmers of Kalamazoo county place upon themselves willingly, a burden greater than the tax-gatherer every year in neglecting to properly care for their agricultural implements. And what is true of Kalamazoo county is true all over the country. Every farmer should be the owner of a few tools known as carpenter's tools, and have some knowledge of their use; then have a small lot of lumber of various kinds and sizes, so that if an implement breaks he can repair it, many times in less time than it takes to go to town and get it repaired, and then have the satisfaction of knowing that it is paid for when so repaired, without taking the money laid by for other necessaries, or luxuries, even—without going in debt for it, either.

A few more thoughts and I leave the subject with you. Our country is flooded with smooth-tongued men with teams drawing almost every conceivable kind of implement to our very door, and urging us—yes, begging us—to try their implements; we need not buy if we do not wish to, only just try them; they "would like our opinion of their merits." You tell them that you do not wish to buy. "Oh! that does not make any difference; you certainly will have no objection to trying it." And just as soon as you consent, they know that in nine cases out of ten the battle is more than half won.

Now everybody knows that the cost or expense of keeping this army of agents in the field is added directly to the price of the article, and that this is sometimes about one-half of the cost.

A manufacturer of fanning mills told me that it cost him about seven dollars on an average to sell one mill. If it costs seven dollars to sell a fanning mill, what will it cost to sell a reaper, or self-binding harvester?

No one knows better than the manufacturer and dealer in agricultural implements that by this means they can induce us farmers to buy many implements that we have no more use for than a cow has for standing collars. I once knew a farmer—and he not a very wealthy one, either—to have four and sometimes five fanning mills in his barn at one time, and all new, or nearly so, either one of which would have done his work in a satisfactory manner. And right here let me say that in the course of time an agent came along with, not a fanning mill, but an order from the circuit court, and instead of selling him a fanning mill, sold his farm.

I wish that every farmer would positively refuse to buy any implement of a traveling agent, and insist and demand that they be kept in some store where we can go and buy them, just the same as we go and buy our tea, coffee, and sugar.

And now I leave this subject in your hands, hoping that you will thoroughly discuss it.

PROPER METHOD OF CONDUCTING AGRICULTURAL FAIRS.

BY D. M. GARDNER.

[Read at Farmington Institute.]

We shall take for granted, that the method which will result in the greatest good to the greatest number of those engaged in the occupation of agriculture, should be adopted.

Fairs have been in existence in England and other European countries for centuries. These fairs were first instituted as places of traffic in general merchandise, with but little reference to the agricultural development of the country, or the improvement of its products. These fairs were all conducted on the same plan, differing only to suit the moral and social condition of the people. And as the sale of all kinds of merchandise which fashion could devise, or fancy covet, was the great object to be attained, it was deemed necessary to devise some means by which the great mass of the people could be brought together. To accomplish this object, all manner of devices were resorted to, among which were cudgel-playing, cock fights, sack races, wheelbarrow races, greased pigs, games of chance, and, in some instances, honors were conferred on the hero who could drink his fellows drunk. These drolleries had the desired effect of attracting large crowds, but resulted in degrading the morals of the people.

This class of fairs, among which were Bartholomew fair, near London, Greenwich fair, Glascow fair, and Donny-brook fair, near Dublin, has become extinct, by the withdrawal of the support of the better classes on account of their pernicious influence upon the people.

The fairs that have been retained as of value are the stock market fairs of England and Scotland. At these fairs some of the finest stock in the United Kingdom is placed upon the market in general competition, and buyers come from long distances to make their purchases. These fairs have proved to be of great value, both to the buyers and sellers, and have been a great aid in raising their stock to its present high state of perfection.

Our American fairs, though organized on an entirely different plan from those of England, are in many respects more in keeping with the rapid progress we have made in the methods of agriculture. The excluding of the market feature from our fairs, and adopting the system of awarding premiums to those producing the finest specimens in the different classes of exhibits, has undoubtedly had a great tendency to stimulate the agriculturist to a greater effort for the production of better specimens in his line of products, than any other system could have done.

Yet, if we should add to our fairs a department especially for the purchase and sale of well bred stock, where producers would be brought in direct competition, and the purchasers could make their selection with better satisfaction, in our opinion the practical value of our fairs would be largely increased. But instead of adopting this most redeeming feature of the European fairs, we are adopting those things that caused their destruction, viz.: Those disreputable concerns, among which we might mention, the wheel of fortune in divers forms, throwing balls to knock down rag babies to win or lose cigars, target-shooting for the same purpose, and in some instances the open saloon, and many other devises for swindling men and boys out of their money.

These nuisances, for a small money consideration, are often given the exclusive control of some of the most prominent localities on the fair grounds.

Financially, this course is penny wise, but pound foolish; for every penny they pay to the society, they take ninety-nine cents out of its patrons, while the evil influence exerted upon our boys is much more to be deplored, and if continued must cause many of our best citizens to withhold their patronage. We think there might be much more practical knowledge acquired and disseminated, if exhibitors were requested to attend more on their exhibits, and explain to visitors the best methods of cultivation in producing the articles they have on exhibition.

Great care should be taken in the selection of competent judges, free from individual prejudices, and well qualified to judge between a good article and a monstrosity; such persons as are interested in the success of the fair, and are willing to give their best services, giving no occasion for the complaint so often heard, that the name of the exhibitor took the prize rather than the article exhibited.

The location of our principal fairs in or near our large cities, we consider as detrimental to the best interests of farmers; for it often throws them under the control of those who have no practical knowledge of agriculture, and also brings our young people more directly under the influence of the outcasts of society, who congregate in cities,—city sight-seeing often absorbing the attention that would otherwise be given to the benefits of the fair.

We now come to the subject which has been considered by many the most objectionable feature of our fairs, viz.: the races. We are of the opinion that the evil results usually complained of do not come from properly testing the speed of horses, but from the manner in which it is done. There is and must always be a demand for the roadster as well as the draft horse, and as speed, ease of motion, and endurance are necessary qualifications for this class of horses, it would seem necessary that these qualities should be tested, in order that just conclusions should be arrived at, and premiums properly awarded. We would further suggest that all loss of time, and useless delays by jockeying in scoring, should be strictly prohibited; and, in our opinion, the best method to accomplish the end would be to test each horse on time. The modern horse race adds nothing of value to agricultural fairs, but is controlled by and in the interest of a class of persons known as sporting men, whose occupation differs as much from that of the farmer, as the board of trade man's occupation differs from that of the agriculturist, on whose wheat he speculates.

The present practice of giving fifty dollars to the successful jockey who wins the race in our agricultural fairs, and but five dollars to the farmer who rears a premium horse, is disgustingly obvious to all, and no comment is needed further than to say that it is placing a premium on an occupation, which is, to say the least, considered disreputable by many.

We have presented these suggestions, as the subject would seem to demand, from a purely agricultural standpoint. It becomes farmers to look wisely after their own interests, and to see that these organizations for the advancement of our interests are conducted in such a manner as to elevate our calling, by stimulating us to a greater effort to improve both the quantity and quality of our products.

We cheerfully accord to all producing classes the right to exhibit at our fairs, that we may labor together for the good of each, and the welfare of humanity.

DUTY OF THE FARMER TO INSURE AGAINST FIRE.

BY ELLIOTT H. ANGELL.

[Read at Leslie Institute.]

Fire insurance! What is it? It is a contract by which a number of persons form themselves into an association, mutually agreeing to share each others loss by fire, or a contract by which a stock corporation, in consideration of the payment of a specified sum of money, agrees with an individual to pay to him or to his legal representatives, a stipulated sum of money in case of loss by fire. Now that we have seen what insurance is, the question we wish to consider now is: Is it the duty of farmers to become members of such an association, or enter into a contract with a stock corporation for the purpose of such insurance?

We will take broad ground in this. We hold that it is a moral, a social, and a religious duty of every owner of inflammable property to avail himself of some means of security against a total loss in case of the destruction of his property by fire.

The moral responsibility of every man to provide, not only for the present wants of his dependents, but, so far as is in his power, for their future necessities, also, will not be seriously questioned. This responsibility is enforced by every moral feeling, by every tie of affection, by every impulse of his nature that tends to awaken sympathy for any in distress who are dependent upon his energy, his foresight, or his wisdom for their support. It is a social duty for every many who has any means to do so to avert as far as possible any calamity that will embarrass his own prosperity or the prosperity and happiness of the society in which he lives. If our buildings are destroyed by fire and we are obliged to re-build without the aid of insurance, it is liable to place us under embarrassments from which we may never extricate ourselves. Nearly every farmer is already in debt as much as it is prudent for him to undertake to pay. Then if he meets this unexpected demand he is obliged to use money he had promised his creditors, and the creditor is disappointed in getting his dues and must necessarily fail to meet his engagements, and so on indefinitely, thus creating not only a social, but in a small way a financial panic.

It is a religious duty, for in 1st Timothy, 5:8, we read: "If any provide not for his own, especially for those of his own house, he hath denied the faith and is worse than an infidel." Now if we allow our property to remain exposed to destruction by the devouring element without insurance, and ourselves exposed to financial embarrassment, such as would result from such loss, do we not fail to provide for our own household? Do we not expose to suffering and privation those who should have our first and most anxious consideration? Do we not almost willfully disregard a plainly implied injunction of Scripture? Do we not also subject ourselves to a life of drudgery from which a little exercise of prudential foresight might have saved us? When the subject of insurance is the topic in conversation there are very many who will excuse themselves by saying I am very careful with fire, and will detail to you the very many ways in which they exercise care.

To such I would say we do not know how or when fire is coming. If we did, we would have but few fires; we would be there first. The best arranged stoves, pipes, and chimneys cannot save you from a flash of lightning, or the bursting of a lamp, or the match of some tramp who sleeps in your barn and is careless with his smoking. Every week our mail brings to us long lists of damages by fire that represent millions of dollars of loss, and hundreds of these very careful men that have no need of insurance, and who are financially ruined. We read over these long lists of casualties and think very little of it. They are a long way off, and do not disturb us much. We also hear the warning in the sharp crash of thunder as it echoes and re-echoes through the rent air. We see its threatenings written in streams of electric light as it paints the warning on the approaching storm cloud, and yet take no alarm. And too, we sometimes hear the wail and witness the anguish of frantic, panic-stricken neighbors whose homes lie in ashes at their feet.

Twice, within a month, have such scenes been witnessed in the town where I live. Two homes laid waste by the fire fiend, two families of small children turned out of doors at dead of night in mid winter. One had small insurance, and one had no insurance. The first thought a little insurance a good thing, and secured it; the other was one of these very careful men, who do not need to insure. Both houses were burned at night, when it was not easy to raise help, so the fire made a clean sweep. They each lost all. All, did I say? No, all was not burned. They both have a mortgage left; that withstood the flame. The one with insurance can pay his mortgage or build another house; the other must let the farm pay his mortgage. Now, if we concede that insurance is necessary, the next question of importance is: How, where, or with what company shall we insure? First, select a company whose reliability is not questioned; second, consider the promptness with which they meet their losses; third, the cost of insurance. But do not let this last consideration absorb the other two. It is well to consider cheapness, if with it we can combine reliability and promptness.

If I were to advise in the selection of a company for the farmers of this county, I would recommend the Farmers' Mutual of Ingham county. I would recommend this company from all of the considerations named: its reliability, its promptness, and its cheapness. When I recommend this company I know whereof I affirm. I speak from experience as well as from observation. I have myself had experience as a fire sufferer. There are other reasons why we should support our home institution. By doing so we keep our money at home instead of sending it to enrich eastern capitalists. They in turn send it back here to be loaned at exorbitant rates of interest. The Michigan State agent of an eastern company doing business in this county paid advertising rates for publishing in the papers of this county, one year ago, a letter congratulating a sub-agent upon the flattering prospects of their business, stating that the company had made a net gain, over all expenses, of over $338,000. This was indeed a subject for self-congratulation with the stockholders, but how does it look to the policy holders? It tells them that the company has extorted from them this vast sum of money, over and above the actual cost of insurance.

Now I wish to congratulate my brother farmers of Ingham county who are members of the Mutual, that we have had just as safe insurance in a company that adjusts its losses more promptly, and that we have saved to ourselves our share, according to the amount insured, of that $338,000.

MIXED FARMING.

BY GEORGE HINKSON.

[Read at Jeddo Institute.]

On the evening of the 10th inst. I received a copy of the programme of this institute. On looking through it I discovered I was named for a paper on the subject of "Mixed Farming." This was the first intimation I had that I was on your programme at all. I am sorry the partiality of my friends took that direction. First on account of my lack of time in which to prepare, and in the next place my unfitness for the task.

It is not necessary here to say to the older of my acquaintances, many of whom I now see before me, that I have been all my life from boyhood up more used to using the ax and holding the plow than using the pen. I have always lived on the farm—came into what was then a part of this county with my father in the winter of '45-6, a stripling of a boy, and with him settled on the same farm I now live on and own—then a part of the vast wilderness that extended from Port Huron north to Saginaw Bay, except here and there, and frequently at long distances apart, settlers with a small log shanty or log house with patches of clearing not much larger than their habitations, and parties of lumbermen engaged in cutting and sending abroad the wealth of the forests then almost untouched. That was a long time ago—thirty-six years—more than the average lifetime of the human race. The little children of that time are the middle aged men and women of to-day. The middle age of that time—the pioneers, the men and women of willing hands and strong hearts, are nearly all gone—have passed the bourne whence none ever returns. Peace to their memories, "their works do follow them."

The physical features of the country, too, have changed; the forests have given place to well cleared, well fenced, and in many cases well cultivated farms. The small and often very uncomfortable log shanty, and the somewhat more comfortable and pretentious log houses, have been replaced by the substantial, comfortable, and in some cases beautiful residences that dot the landscape on every hand. The log stable and log barn, too, have been replaced by the well built and capacious frame barns. During the time the land was being cleared of trees, and indeed during the subsequent period, or what I would call the second period of our agriculture, the time when we were removing the stumps from our farms, there was little said and quite as little thought about "systems of farming" so-called.

Our lands, naturally of good fertility, were then in their virgin state. Good crops were the rule, and though our farming was of the rudest sort, we never failed to get paying crops. Such is not now the case. And why not? is a very natural and at the same time a very pertinent inquiry. My answer is we have removed from the soil in the form of cereal crops the fertility that was ages in accumulating, without returning anything to speak of to the soil to compensate for the drafts made upon it. That all our older lands fail to produce as they did when new, will be conceded, I think, by all. As to the best means of preserving the fertility of our lands and restoring that already well worn, possibly we may differ. I think it can be done in no other way so effectively and cheaply as by a well considered and thoroughly executed system of mixed farming. By mixed farming I mean the practice of planting a certain area of our farms to each of the grains and grasses that grow and thrive in our latitude; also carrying on our farm all the stock we can keep well in connection with our grain and grass growing. The ruinous practice of selling our coarse grain, hay, and straw from the farm, should be abandoned at once and forever. They should be fed on the farm, made into beef, pork, mutton, wool, butter, cheese, sheep, cows, horseflesh, or any other product that will bring cash and leave a large pile of good manure to put back on the land. Some farmers act as if they believed wet straw to be good manure. Straw manure is poor stuff anyway and in any form, but as an aid in making manure it is useful and valuable.

Every farm should increase instead of decrease in fertility, and it will with good farming. No amount of theorizing is of any value in this matter unless supported by facts. It is the testimony of eminent writers on the subject that in England, France, and Holland, where a careful and systematic system of husbandry prevails, their lands are far more productive to-day than they were one hundred years ago.

Pardon me just here for being personal. I do not desire to be, but I cannot well avoid it. My own farm produces better crops and with more certainty than it did fifteen years ago, with the single exception of winter wheat. That grows as well as ever but winter kills. I have relied upon clover and thorough cultivation. I try not to raise any weeds—rotation of crops and all the manure I can make by keeping as large a stock as my farm will carry.

I raised last season on eight measured acres of barley 45⅝ bushels to the acre of 46 and 47-pound barley. If the season had been favorable I think I should have had 60 bushels of 48-pound barley to the acre. It was after winter wheat, part of it manured with barnyard manure, and the balance with superphosphate at the rate of 150 pounds to the acre. The part dressed with superphosphate had as good barley as the part manured, and better wheat. I had another piece of barley of 3½ acres, that yielded 37 bushels to the acre of 48-pound barley, without any special preparation except that the ground was very clean. The moral here is that these are the crops the money is in. It needs no argument to prove that it is better to raise 45 bushels to the acre on 8 acres, than 22½ on 16 acres. Fifteen years ago I could not raise such crops on the same land. Such results, however, cannot be attained by sitting around corner groceries. It requires energy, perseverance, industry, and intelligence.

Some farmers seem to pursue almost fanatically a single branch of industry long after it ceases to pay—the raising of wheat for example. The eminently practical character of the average American seems in this case to desert him. Changed conditions require changed practice. Wherever you find agriculture lacking in diversity, you find the people ignorant, poor, and squalid generally. In countries or sections where a diversity prevails, education, prosperity, and plenty are found. This is true of the Old World, and it is equally true of the new.

In the north, where a mixed system so largely prevails, wealth, intelligence, and general prosperity are found. In the south, where for generations they have expended all their energies in the production of a few crops—tobacco, sugar, rice, and cotton—we find the country sparsely settled, their lands worn out and abandoned, the people poor and generally a lower type of civilization.

Yes, I believe in mixed farming. I believe in mixed farming because it is necessary. It is the only practicable way I know of to keep up the producing power of our farms. If our farms are allowed to deteriorate it is only a question of time when they will have to go into other hands. What would you think of the wisdom of the man having, say $4,000, invested at interest, who, in addition to using the interest yearly, should also use a part of his principal? You would say at once, he will soon have neither interest nor principal; he will be bankrupt. A farmer has a farm worth $4,000. The farm is his principal. The producing power of his farm is his interest. As the person having the money at interest will become bankrupt if he persists in using a part of his principal yearly besides his interest, just so surely will the farmer become bankrupt if he allows the producing power of his farm to become impaired. The analogy between the capitalist and the farmer is in this respect perfect.

This is not a fanciful idea nor an overdrawn picture. The commissioner of agriculture of the United States in one of his annual reports says that in some of the New England States thousands of acres have been literally abandoned and are lying untilled and unoccupied. These lands were once occupied by a virtuous, industrious, and I think in a certain sense, prodigal people. The same is true of large areas in many of the southern States. Have you not known farms to have been sold because they would no longer sustain their owners? I have.

There can be no specific rules laid down for rotation of crops, or amount or kinds of stock to be kept; all such rules must from the nature of the case be general. Every one must deduce from general principles the rotation, kind, amount of stock that will best suit his own case, assuming that it is necessary to have stock he must decide for himself how much he can keep with profit, always keeping the best within his reach and means. I will say, however, it is best to plow only so much as can be kept in good condition, seeding to grass the balance for pasture and hay. The great mistake is plowing too much. The more hay and pasture the more milk, the more butter, the more wool, the larger and better the manure pile, and then the more hay and grain again. I believe in mixed farming, because it is surest to pay. The farmer who raises a variety of crops is always sure to hit the market right somewhere. If wheat is low perhaps the butter crop will bring a good price. If barley is cheap beef may pay well, so that a ready sale and paying prices will be realized. When a variety of crops are raised the season for putting them in and harvesting is so lengthened that less help is required, and a saving effected in that way.

I like it, too, because it affords opportunities and leisure for mental improvement. The season of our labor runs through the whole year without any particular hurry at any time, giving us plenty of time for reading books and papers, and enjoying social intercourse.

I attribute a large share of the prosperity of this locality—for I think it prosperous—to this very system of mixed farming. We have been forced by circumstances to practice it. Our farms, as a rule, are small, thus forcing us to pursue in some form the very system that is for our greatest advantage.

Agriculture, like medicine, is not an exact science. It is made up of the experience and observation of scientific and practical men, but the theories of to-day may be disproved to-morrow. The practice of to-day may, on account of further experience and observation, be changed to-morrow. Hence the necessity of an agricultural literature, papers devoted to the interests of culture and agriculturists. This necessity is so generally admitted that all, or nearly all, the weeklies published in the cities have their agricultural editor and more or less space set apart exclusively for such subjects. This is all right so far as it goes, but I think papers published entirely in our interest, making a specialty of farm interests, are a much more reliable aid and guide than are those papers whose only interest in us is to get us to take and pay for their newspaper. The farmer who pursues the mixed system is in greater need of advice and experience of others than is he who makes a particular crop specialty. There is no way of making such knowledge available to the mass of producers that is so effective as through the columns of a good agricultural paper. In my own experience I have had many and valuable helps from that source. My observation has been, too, that those farmers who are the best versed in the condition of agriculture in general are the progressive farmers, have the best stock, best cultivated and most attractive farms, and make the most money. I have no higher ambition than to be a good farmer and own a good farm. I have no higher ambition for my son. The old adage that "Knowledge is power," is, I believe, as true of farmers as of any other class.

MIXED HUSBANDRY.

BY A. C. TOWNE.

[Read at Hastings Institute.]

This question has often been discussed, whether it is best for the farmer to follow what is called "mixed husbandry?" That is growing a variety of the various crops and stock, or to raise special crops for which his soil is adapted, or are most profitable for his market. There are good reasons for following either practice, and it is not always easy to decide which is the right system to pursue. I do not deem it pertinent to the question to go back to the ancients to trace their mode of farming, with their vast herds, or crude implements, but rather to the practice in vogue at the present time amongst our most intelligent farmers—of Barry county.

I assume we are, each of us, farmers from choice, and not because we are not fitted by nature or education to fill any of the various professions, or engage in mercantile, manufacturing, or mechanical pursuits; and that we give our farms the same careful study, and bring to our aid knowledge and science, either gained by our past experience or from agricultural works, the same that all successful persons do to their various callings. The raising the various kinds of grain and stock are so essentially blended together in farm economy, it would seem like destroying one of the old land marks to separate them.

Michigan, our beautiful peninsular State, is essentially a grain-growing State, and is conceded the best in the Union for its fine quality of wheat; second to none in its fine horses; third in amount of wool produced; and, perhaps, second to none in its fine flocks of sheep; and second to none in its thoroughbred cattle and hogs. In any mode of farming, either mixed or special, there are two important questions the intelligent farmer will ever keep in mind, to wit: The maintaining of the fertility of his soil, and that mode of farming that will give him the greatest income with the least expense in labor and money. To maintain the two, there are many reasons in favor of mixed husbandry, as there can be no general failure, because if one crop fails others are maturing at different seasons that are not likely to fail—like the wheat harvest of 1881. Another, the various crops and sales of wool, beef, pork, and mutton coming in at different times of the year, brings in money as needed—a very important matter to the farmer who does not have a bank account to go to for his running expenses.

On many farms a certain rotation of crops seems better for keeping up the fertility of the farm, than to continue it in one or two special crops. Few soils will produce the same crops, or the same class of crops, year after year, and give the best yields, although some crops will do better than others grown in this way—and the degree of cultivation has much to do with it—and give better results. Yet, it is a well known fact that soil does tire, so to speak, of the same crop continued annually, and a steady decrease in yield will be generally noted.

On most farms there is a necessity for raising a certain amount of the several varieties of grain and hay, both as food for teams and other stock, as well as to afford an opportunity to break up and re-seed grass lands. The successful farmer, after providing for his teams and stock, has a surplus of hay, straw, and the different kinds of grain to dispose of; but to sell from his farm would be selling his farm by piece-meals, but wishes to convert the same into manure by machinery as one means of maintaining the fertility of his soil and turning it into ready cash. And here comes in the beauties of mixed farming, as he always has a portion of the machinery on his farm in surplus matured fat cattle, sheep, and hogs, and through them will sell the surplus for double it would bring him in market. Grain growing and stock raising seem to be twin sisters, and go hand in hand, and lead to prosperity. You have only to look around you to your successful farmers and ask them how they have succeeded so well in educating their sons and daughters, erecting such fine farm buildings, and adding from year to year to their domains. Their ready answer will be, we have combined the two. With a wise system of rotation of crops, a liberal supply of clover and timothy seed, the manure from his farm, and from 50 to 100 pounds of gypsum per acre, you need have no fear of your soil deteriorating. Adopt no theoretic mode of farming unless founded upon personal experience.

And now, brother farmers, if we adopt the system of mixed husbandry, it is very important we start right in the kinds of stock we keep on our farms.

HORSES.

What kind shall we keep and breed? I hear your response. Give me size, style, bone and muscle, and a good walking gait, and weighing from 1,200 to 1,400 pounds, and with three of such horses before a plow you can bid defiance to our extremes of weather, and such a horse will always command an extra price in market. Leave the running and trotting horse to the amateur horseman, who has money and time to throw away.

CATTLE.

I approach this part of my subject with temerity, as there are so many noble breeds of cattle to choose from; all have their friends and admirers. I think for the average farmer public opinion is in favor of the thoroughbred. Durham or high grades are the most profitable for milk and beef.

SHEEP.

I will now claim your attention to that source of all profit, and a thing of beauty on the farm, the sheep. I might eulogize the sheep, speak of his docility, domestic habits, the friend and companion of man, from his earliest history to the present; but time and space forbid, and we will pass to the best breeds for the general farmer of Michigan. If the farmer is so located and wishes to breed for mutton alone, the Cotswolds of Shropshire, or Southdowns, may be the best; but when mutton and wool and the greatest amount of money is sought after the American Merino is far in advance. They seem to be the sheep that combine more good qualities than any other breed. Their hardiness, heavy fleece, fine quality of wool and fine fattening quality stamp them preëminently the sheep for us.

HOGS.

That little beauty, and how mischievous and annoying at times, and yet so little care. Give him a good, warm bed for winter protection, the slop from the house, three ears of corn per day, good clover pasture with corn continued and the range of your wheat stubble, and you have converted that little frisky pig into 350 or 400 pounds of matured hog. One word as to the different breeds. Give me the Poland China.

In conclusion, brother farmers, enter into the very spirit of your chosen calling, feed your farm, feed it liberally, feed everything you have on your farm; provide good, comfortable winter quarters for them; attend all these Institutes or farmers' gatherings, honor your calling and you will be an honor to it.

A FARMER'S LIFE.

BY CHARLES BAUER.

[Read at Hastings Institute.]

Enjoyment is what makes life desirable. It is because our joys and pleasures overbalance our sorrows and pains, that we desire to live at all. The person who enjoys most, makes the most of life. It is not fancied joys and pleasures which we are speaking of, but real unalloyed gratifications of the mind, joys which breed no sorrows, pleasures which leave no sting. We often hear the pleasures of the world lightly spoken of as though they were of small account, but what would the world be without them? They are the only pleasures we have experienced, or have any knowledge of. Take from us the pleasures and enjoyments, and you leave life a barren waste. It is our privilege and duty to seek the greatest possible amount of enjoyment; therefore, adaptation to give enjoyment is the criterion by which the different occupations in life should be compared and judged. In comparing a farmer's life with other occupations, we prefer to consider them philosophically rather than historically. We prefer to consider their capabilities rather than their present aspect. No one will contend that the life of the ordinary farmer is what it ought to be. As farming was the first occupation of civilized man, it will probably be the last to take the place which reason assigns it. Old habits, prejudices, and superstitions are clogs on the wheels of progress, and probably no occupation is more effected by them than that of farming. As farmers have inherited their peculiarities of thought and manners of life through a long line of ancestry, and as they constitute the great mass of the people, it is not to be expected that new ideas will make as rapid progress among them as among those belonging to occupations of more recent origin, and which are themselves innovations. Where reason originates an occupation it is more apt to be conducted rationally than when the occupation, like farming, is more the result of animal instinct. For these reasons a farmer's life does not at present occupy that proud eminence among the callings of men which it is destined to occupy in the future, and which its nature admits of.

It is a fact which must be admitted, that the amount of brain work expended in farming is altogether too meager when compared with the amount of physical labor expended. Farming has been and is too much a matter of routine. Farmers pursue a certain course, not so much because reason dictates it, as because it has been customary. When the mass of farmers shall be controlled in all their affairs by reason, a farmer's life will be historically what it is philosophically, the noblest calling to which a man can aspire.

Let us briefly consider what a farmer's life is, philosophically: The first thing in importance is to live, and the farmer produces and can control the means of living. It is possible for the farmer to live independent of other callings, but no other occupation can live independent of the farmer. Those who till the soil are the kings among men. It is within their power to realize just such profits from their toil as they see fit, and to bring all others to subjection. They belong to the majority class, and possess the power of numbers as well as the advantage of occupation. If evils exist in government or in society it is possible for farmers to do away with them. In fact it is possible for them to have just such a government or society as they desire.

All our aspiration comes from nature, and what class are more favorably situated for observing and studying natural phenomena than the tillers of the soil and the domesticators of animals? Our greatest poets, artists, scientists, and philosophers go to the country for their facts, and to enjoy their meditations. What an advantage is possessed by those whose occupation brings them constantly into communion with nature. Of all classes of men, why should not farmers be most intelligent, most thoughtful, and most familiar with their mother earth?

Home and friends, two of the sweetest words in the English language, have an especial charm when used in connection with rural life. The farmer's home is capable of being the abode of the most exquisite domestic joys, such as city life can rarely afford. The farmer's friendships are most familiar and confidential, and are rarely broken except by death. If good digestion and good health, independence and conscious power, a thoughtful mind and an insight into nature, home, and friends, reciprocal love and affection are the sources of enjoyment, the farmer ought to be the happiest man on earth, and the farmer's life of all others the most to be desired.

The impetus given to thought and free inquiry by the scientific discoveries of the present century as well as by the invention of labor saving machines and the improved facilities for communication and transportation like leaven is working in all classes of society. The farmer is no longer satisfied with doing as his fathers have done before him. He is seeking new methods. He is prosecuting his business more systematically. He is exercising his reasoning powers. He is computing the profits and losses. He is seeking the coöperation of his brother farmers, with a view of realizing what is in his opinion an adequate price for his productions. In short, he is doing just what they do in all other kinds of business, to wit: Looking out for his own interests. There is nothing which shows the advantage which the farmer possesses over the other occupations more clearly than the fact that he has been moderately successful, even when his business has been conducted after the old style without rational methods, without system, without knowledge of the markets or the cost of transportation, the victim of his own ignorance and improvidence, and the prey of speculators and transportation companies. No other business could have withstood such management for a single year, and yet we say the farmer has been moderately successful.

Although some farmers have begun to think for themselves, they are not all thinking. Others are making no effort to get out of the old ruts. While much may be accomplished by individual effort and forethought, the farmer cannot compel the payment of an adequate price for his productions, nor prevent the extortions of transportation companies, without the coöperation of his brother farmers. Farmers ought to agree upon what would be a fair price for their productions, and then unite in demanding it. When transportation companies charge extortionate or unequal rates for carrying their productions, they ought to unite in demanding that such companies be restricted by proper legislation. "In union there is strength," and farmers can accomplish anything in this direction which they desire, provided they unite in demanding it.

It is said that some farmers are in debt and are compelled to sell for prices which are offered. This is undoubtedly true, but they should get out of debt as soon as possible. No farmer should be a slave, and indebtedness is one kind of slavery and a very bad kind. Better forego some or all the luxuries of life for a time, and be a free man. To continually live under the lash of creditors is not rational conduct in any man, and especially unnecessary and foolish in the farmer. There is really two kinds of indebtedness, rational indebtedness and foolish indebtedness. It is reasonable to run in debt when there is a certainty of gain and a certainty of speedy payment. It is foolish to run in debt when there is no good prospect of gain and no good prospect of payment. It is still more foolish to run in debt without a thought of the pay day, as it is quite evident many do. What is more absurd than to destroy all prospects of happiness in life? It is impossible for a man to be happy while laboring in the toils of pressing creditors. There are enough farmers, if they unite, to control the price of their productions. They need to take hold of their farming as though it were a business which needs management, and is not capable of running itself. They need to learn that intelligence is just as necessary to make successful farmers as to follow any other calling. The idea that it requires no education to be a farmer is simply ridiculous, and when we say education we mean mental training, as well as a thorough knowledge of all the facts of science which relates to their special business. What business is more complex and intricate than farming? What business requires more special and general knowledge? What business requires better reasoning powers?

Ideas about farming are sure to undergo a revolution. The farmer of the future will be one of the best educated men, and farming will be classed among the learned professions. In the future it will not be thought possible to successfully conduct a farm without special study and thorough mental training, and the boys and girls will be sent to schools and colleges to fit them as farmers and farmers' wives quite as universally as they are now sent to fit them as lawyers and doctors. In the future, farming will be thought to be all that I have attempted to convince you that it is, to wit: The most desirable occupation because it is capable of giving the greatest possible amount of enjoyment.

THE FARMER'S NEED OF LITERARY DISCIPLINE.

BY GEO. HOWELL.

[Read at Macon Institute.]

Next to good farming, good thinking, and close observation, I would place the ability to clearly and plainly express thoughts upon any topic to which attention has been given, in language concise and felicitous. For, after one has gathered from the fields specimens of former geological eras, or by long and patient observation studied the culture and growth of plants, the habits of insects, the laws of trade, or even the shiftings and twistings in politics, there comes a benefit, a profit, as well as pleasure, in putting the thoughts concerning these and other topics on paper, into essays, or in giving them to an assembly in a clear and unembarrassed voice.

To attain to this ability, pleasure, and profit requires literary discipline, the advantages and need of which I desire to set forth, together with some other thoughts. No one will question that the men and women who are now engaged in agriculture are of sound mind and good judgment; that upon the topics of every-day life, they consider as thoughtfully, they weigh as carefully, they form opinions as correct, and they act as judiciously as those who have given their time and attention to the other professions, or to the various trades. No one will question their intelligence. The domain over which they are spread out, extending, as it does, from our own northern peninsula to the cane, the cotton, and the rice fields of the south, and stretching away from where the Mississippi flows downward to the gulf to where both oceans lie, is, in its extent and vastness, beyond our conception. The variety and magnitude of their gathered productions, when expressed in numbers, out-reach and bewilder the mind, and their climate, with its ever-changing seasons, gives to us

> "A world that is full of the wine of beauty,
> Had we only the time to drink it in."

Here are our people, with a soil that is a treasure-house open to scientific research, with fields that lie scattered over with relics that carry the mind back into the dim and misty ages of the past, with a territory that is illimitable, with productions that are of unmeasured wealth, behind none other in moral excellence and executive ability; and yet we are, as a people, but poorly qualified to discuss questions pertaining to our calling in scientific assemblies, or to represent our interests in the halls of legislation.

What is lacking? What is needed? Not intelligence; not capacity; not subjects of deep and wide interest; but simply literary culture, literary discipline; nothing more, nothing less.

I would not for one moment either entertain or convey the idea that good writing, fine speaking, or even eloquence can take the place of good sound sense, cool deliberate reasoning, or executive ability. Nor do I believe that any one of you will argue that they are either incompatible or inconsistent with good farming. I think it was Hippocrates who said "Life is short, art long, the occasion fleeting, experience fallacious, judgment difficult." But there are no words of discouragement in these words of Hippocrates. They only hasten us on to greater exertion. They remind us of the swift-flying moments. They tell us of the magnitude of the work to be accomplished. They hint at our own weaknesses.

To us farmers the words of the philosopher come: If judgment is difficult, if experience is fallacious, if the occasion is fleeting, if art is long, if life is short, how shall we most advance this science of agriculture to which we are given? The answer comes, give and leave to the co-laborers in our calling the recorded experiences of the fleeting occasion. For who navigates this stream will hasten his voyage as much by a knowledge of the rocks and bars, as by a knowledge of its deep, smooth waters.

The result of not being able to express our thoughts, is, that a vast fund of information now learned by long experience, remains hidden away in the storehouse of memory, until at length, by reason of declining years, it is forgotten and lost. There, too, is lost to us the reciprocal pleasure of entertaining each other with our best written thoughts. Again, we, as wise delegates, go forth to the metropolis of our county, weighed down with the oppressive honors of representing our people, and lo, and behold, the work is all cut and dried for us, and we cannot say them nay, not thus, not thus, for we are hushed to silence behind our own bashfulness, and our interests are not represented in proportion to their extent. The more shrewd and pushing monopolize the larger share of legislation in their benefit. But it is folly for us to complain, for we have not chosen to fit ourselves to represent these interests. With the proper qualifications on our part, and with the people on our side, shrewd, in deed, will be the politician that will give to us a representation co-equal with our agricultural interests. Can we now, so long unaccustomed to literary exercises, attain this culture and discipline? Not so fully as had we begun earlier in life. But we may still arrive at most if not all the practical benefits. How? By the same attention and assiduity with which the fields are cultivated and their surplus wealth treasured.

While there exists in the people these latent faculties that will in time be developed, and will overcome the defect, yet the good time coming could be materially hastened by the help of those already taught in the agricultural schools. But where shall we look for teachers to inspire and direct us in the acquisition of these attainments? Shall we look to the University of Michigan? While we can as yet look for but little direct aid from the University, yet there are from there those, and some of them with us to-day, who are toilers and workers for this, our common good, and I am sure that they will not stay their hands until the work is completed.

How much may we expect from the Agricultural College? A question I wish might be answered at the meeting of this institute, farther than the general diffusion of learning, which is of itself an uplifting power to any people.

Representation is not the only inducement to literary attainments. However desirable it may be to represent the interests of agriculture, there yet remains a vast variety of topics constantly presenting themselves for consideration, some leading into fields of practicability and others into the realms of fancy. Among the practical will be the papers and discussions of this institute. Among those leading into the realms of fancy is this one:

I have been listening to the music of the trees to find out whether they were not conscious of their own and each others existence, and whether there were not a subtile thread of consciousness running through and connecting animal and vegetable life. I know that when forest trees are shaken by rough winds or moved by the gentle summer breeze, each tree gives forth a note of music of its own. I know that the flowering maple and the oxalis, our house plants, droop their leaves at nightfall and lift them again at the approach of morning; that many of our flowering plants, if not all, close their petals at the approach of night, and seemingly awake invigorated at the coming of the morning. I know the sunflower bends its stalk to follow the sun. It is said that certain plants catch insects that come to gather of their honey; so that we may with almost certainty say that the plants perceive and feel, and I doubt not that some close observer will yet find those that hear. So I have been led to inquire, is there not a conscious life in plants, and is there not a reciprocal consciousness existing between them and animals? May not some one of us whose soul is in sweet harmony with nature discover this connecting myth and tell us of it in words as full of harmony as the music of the trees? While there is neither bread nor butter, nor the accumulation of either in thoughts like this that border on the realms of fancy, yet a fine appreciation of nature, finding expression in essays, will lend a helping hand to lift our people into a broader and more complete realization of ideal life.

My home having been for a number of years in the dwelling places of our people, it has given me an opportunity to listen to conversation, and to study quite carefully the mental capacities of both men and women, and I am yet to be convinced that there are any civil or political rights given to men that may not with equal safety be shared by women. Inclined to the opinion that men have more originative genius than women, yet this is fully met by their quicker perception, so that should each enjoy equal advantages, and each be barred by equal restraints, it would be difficult to say which possessed the better mind. Now, as we all consider the mind as the essential element in man, if we for once admit its equality in woman, what shall we say? Is it not folly to argue her physical disabilities as a bar to the enjoyment of equal privileges? To be sure, I would not wish my wife to be a doctor, or a lawyer, or a township supervisor, but have not the least objection in that my neighbor's wife should enjoy one or all of these. Not a whit less generous than the man who was willing that all his wife's relation should go to war. If, then, the girl possesses the same qualities of mind, and, for what you and I know, the same quality and aptness as the boy, why should the doors of the Agricultural College be closed against her admission?

The following explanation suggests itself: Slow have been the steps out from barbarism to that civilization which would admit both sexes to the higher schools and colleges. Does it seem possible that there yet exists in the minds of some the idea that the sister in an agricultural community is not equally advanced in civilization as the brother?

Admit both brother and sister, Why? Agriculture and horticulture and floriculture are fast coming to take places by the side of the other sciences. The master minds engaged in these occupations are soon, if not now, to stand with those of divinity, medicine, and law; not that they—divinity, medicine, and law—have descended from their high estate, but that agriculture has risen to the level of them.

Said a public speaker in his lecture on the "World's To-morrow:" "Great men are as great to-day as ever in the ages past, but they appear not so, for the people have risen to the height of great men." So, too, has agriculture risen to the height of the other professions. Now, if we are to have a school in agriculture at all, we want one that will educate the girl in horticulture and floriculture as well as the boy in soil-tilling and stock-raising. The time is not far distant when men and women will no longer be simply accumulators and treasurers of the surplus productions, but the full enjoyers of those treasures. Some of the hours now given labor will be devoted to leisure. A slow and gradual change is taking place in society. The warm-hearted friendliness that was common to all in earlier times is passing away. The rich man will become richer, and the poor man poorer than now. There are not so many 40-acre farms now as there were 30 years ago; there will not be so many 30 years hence as now.

In the time coming it will be necessary for the more well-to-do class to lessen the number of hours now devoted to labor, and to give employment to the more needful. The question arises, Has not that time already come? And to what shall these hours be devoted, if not to scientific investigation and literary culture? Then if we need any agricultural college at all, we need one that will fit young men and women for the duties that the coming years are crowding so fast upon them. We want more than this. We want one that will give girls an out-door exercise—exercise in the orchard and garden. One that will educate both muscle and brain. One that will conduce to mental and physical vigor. One that will combine a knowledge of horticulture and floriculture, with a discipline in essay writing, in elocution, in debate, and in parliamentary usages, so that when they come home to us, they may be helpers and instructors of the people in all that pertains to the art, the science, and the politics of agriculture. So that when they become the owners and tillers of the soil they may be qualified to represent the interest of agriculture in all its departments.

A professor in the medical department of the University of Michigan said to his graduating class: "Young men, go out into the field of science and glean, and when you have gathered sheaves bring them and lay them at the feet of your alma mater." May we not ask the professors of our Agricultural College to say to their students: Go into the fields of agriculture and glean, and when you have gathered sheaves, lay them not at the feet of your alma mater, but at the feet of those who, by long and patient tillage of the soil, have contributed to the erection and continuance of this institution, and cease not to labor for and with that people until they have attained to that degree of literary excellence that will enable them to express themselves, and to represent themselves in all that pertains to their avocation? Do this, and be assured that we, on our part, will not cease to toil, nor to appropriate from our gathered wealth that material aid that will make the college the full realization of your endeavors.

EDUCATION.

BY R. L. TAYLOR.

[Read at Lapeer Institute.]

There are few at the present time who have the temerity to deny that it is the right and the duty of the State to make some provision for the education of the rising generation, but there are many on every hand who, while admitting this, are getting restive under doubts respecting both the quality of the education actually provided, as well as the proper limit to be observed by the State in its educational work. They are by no means few who intelligently question the right of a community to educate the few at the expense of the many; and their number is increasing. You may hear everywhere questions like these: Ought the public to pay for a benefit which is wholly or chiefly private? Should one be taxed to educate the children of others in matters of which the advantage is not chiefly a public one? Is it equal or just that the physician, the farmer, the lawyer, should be educated at the expense of the merchant, the manufacturer, the mechanic? Is there no limit to the number of branches of learning which the government should undertake to teach? And it is useless to deny that the answers suggested by these questions have force, and are entitled to careful consideration.

I do not, however, propose to discuss these points here, but shall take ground upon which all can stand, viz.: That there ought to be provided at public expense such education as will prepare the youth to act well the part of good citizens. In other words, the State should give her youth a thorough acquaintance with the common branches of English education, and train them to be active, healthy, and vigorous in body and mind, and strong in patriotism, morality, and practical intelligence. There is much complaint and a widespread conviction that the duty of the public in this respect is not properly discharged.

Believing that there is great reason for this conviction, and taking it for granted that you are all anxious to correct the defects of our school system, and so perfect and perpetuate it, I propose briefly to suggest some points wherein prompt measures for improvement seem demanded.

Though the State should attempt no more, it is evident that she would do a great work well if she should succeed in so administering a system of education as to cause her young citizens to grow up, as I have said, active, healthy, and vigorous in body and mind, and strong in patriotism, morality, and practical intelligence; and it requires no argument to convince you that these qualities can best be secured, and only fully secured, by giving careful attention to them early in the life of the pupil. These, the chief objects of education by the State, must be attained, if attained at all, in the common schools. It is while in these schools that the conditions upon which the healthy growth of the embryo citizen in these characteristics depends, are most liable to perversion, and most susceptible of correction. It is at this age that the young minds form the images of patriotism, morality, and duty that will in all probability attend them through life. If those images are grand and stately so they will be apt to remain. If thorough inefficiency, ignorance, or neglect on the part of the officers or the teachers, those images are dwarfed and deformed, the State will find that she is warming in her bosom a brood of vipers. But if on the other hand these schools be conducted in the manner best calculated to make these ideas correct and ingrained, and to establish health of body, giving the information and inclination necessary to secure its continued preservation, thereby insuring a healthy mind, together with systematic training in the common school branches of education, the community is performing a great duty well.

Thus far there is no question the State ought to go. These interests are primary, fundamental, common, public. That they be fostered is directly for the benefit of the State—for the equal advantage of every good, loyal citizen. No class or individual can properly be said to be benefited at the expense of any other class or individual. It follows that whatever is to be the fate of the higher branches of our school system, the common school must be perpetuated. And though the higher schools be preserved in their integrity, it must be admitted that the common schools involve infinitely the greater interests both from the multitudes who are instructed in them as well as from the ease with which the minds of those multitudes, owing to their youth and ready receptivity, are molded. These minds are clay in the hands of the potter—every impression made soon becomes indelible. Under the hand of the master who is in love with the strength and simplicity of nature they are wrought into forms which shall delight and bless. Under the hand of the amateur, the smatterer, they are ruined or become at best but ignoble vessels. It goes without saying, then, that these schools should secure a degree of care and attention proportioned more nearly to their importance.

This view of the subject introduces some glaring defects in the ordinary management of our schools.

And first, on account of the immensely greater importance of the common school in its possible effect upon the character of the rising generation of citizens we should expect to see a burning interest shown on all hands in its conveniences, comfort, prosperity, and solid success. On the contrary, the interest of the public is centered in the high school and in the higher branches. The interest is greater in seeing a pupil finish his education, as it is phrased, than in seeing him begin and pursue it aright. If money is to be poured out it is for the high school. If well ventilated, comfortable, and spacious halls are to be provided they are provided for the high school. If apparatus is to be used it is used by the high school pupil. But the helpless innocents of the primary school get their first ideas of education crowded together in the stupor-producing atmosphere of a room contracted, ill-equipped, and worse ventilated.

Again, in the all-important matter of teachers, we should expect to see school officers and all others directly interested in the primary schools, by common consent striving to secure the services of the most competent. We should not expect to see them rest satisfied with the fact that the candidate for the office of teacher bears a certificate from a board which may be both careless and incompetent, as well as partial. We should look for a careful examination into the candidate's ideas of the object to be attained by teaching, into his aptitude, tact, common-sense, and energy. On the contrary, the question of employing a teacher generally turns upon the amount of the wages demanded.

The result is that into these schools of almost helpless children, where the nicest and most careful work that human mind can compass awaits the doing, are often sent as teachers those who know as little of the true nature of teaching as do their young pupils. I need not take time to recount the effect which this kind of management must have upon the results which the community ought to expect and to receive from the common school. It is no doubt true that one obstacle in the way of success is the lack of competent teachers. But there will probably always be a lack so long as incompetent ones are accepted. The one great obstacle is the lack of a proper sense of the incomparable greater importance of the common schools, as compared with the higher ones.

Having offered these almost naked suggestions, for the time allowed me would not permit more, let me close by making a suggestion or two upon the duty or rather upon the failure of the higher schools to supply the want for competent teachers. The best reason the high school can give for its existence at the expense of the public is that it is needed to meet this want. But is it not true that it proves itself inefficient to a remarkable degree in that work? The interests of the state do not necessarily require teachers who are encyclopædias of learning, but teachers of practical common sense, trained to think and apt in bringing into active exercise the reasoning powers of the young—teachers who have a comprehension and an abiding idea of the requisite of good American citizenship, viz.: Activity of intellect, morality, health, a love for manual labor and a belief in the honorable nature of such labor, and a hatred of shame and pretenses—teachers who realize that mind grows symmetrically by the active, independent exercise of its faculties and not by simply remembering what is read or told; and that the mind is valuable in proportion to the amount of such training it receives and not in proportion to the amount of learning memorized. If I am not greatly mistaken, a large proportion of of these high schools are justly liable to the charge of failure in all these respects. It is notorious that from the beginning of a term of school to its close the eye of the teacher and of the scholar is kept on the examination to be held at the end of the term—an examination at which success depends principally upon the pupil's verbal memory of the contents of the pages scanned during the dozen previous weeks. Teacher and pupil stake their reputations upon the result of such delusive examinations. The consequence is that all the more important requisites of training vanish from their view and we have the pouring in process, pure and simple, instead of the educating or drawing out process.

One is tempted to think that it is a stigma on our school management that from a training on the streets there grow up boys excelling the graduates of our schools in activity of mind and strength of intellect and of body. It is not to the credit of our schools that their graduates are so frequently distanced in the race of life by those who in youth were denizens of the street or of the backwoods.

Again, it should be a cardinal virtue of the American citizen that he love labor and honor every manual employment. The undercurrent of the influence at work in these high schools is in conflict with this doctrine. It is not indeed an open, avowed opposition to these principles. If it were undisguised it would be promptly resisted by many who fall in with the silent influence. It comes like the rain falling gently upon the mountain side, apparently all harmless, but in its effects it is as destructive as is the rain formed into the mountain torrent, carrying death and destruction into the plain below. It works by complimenting the fashionable form, the fine clothes, the cheek seldom seen by sun or fanned by breeze, the soft hand, the languid air. Not always an explicit compliment, but yet a compliment. You know how it is done. And in every school the scholars who have these characteristics are the petted ones. There need be no surprise then that the youth, so sensitive to praise, affect these things and seek to acquire them. The result will be as the past and the present teach, that their children, if not themselves, will be supplanted in the business of the country by the children of those reared on the frontiers and on the farm who have only the scantiest means of education in schools. To be of value to the state citizens must grow up hardy, vigorous of intellect, simple in life and manners,—qualities too generally disregarded by teachers. I hear it said that the English oarsmen recently, in attempting to arrange a race with the oarsmen of this country, proposed to establish a rule to admit no one to take part in the contest who had ever earned a dollar by his personal labor. They wanted only gentlemen. I am sure we do not want to transplant any such slip of English Philistinism into the soil of this country.

Thus without taking the time necessary to elaborate them I have mentioned some of the matters necessary, as it seems to me, to be kept in mind in considering the questions vital to the interests of our school system. And whether you assent to what I have said or not I shall be repaid for my effort if I have succeeded in arousing in any of you a livelier interest in the management and success of your own schools.

HOW SHALL FARMERS EDUCATE THEIR BOYS?

BY WM. B. HAMILTON, M. D.

[Read at Lapeer Institute.]

I have chosen to put the caption of this essay into the form of a question, because I mean that what I shall say may be taken only as suggestions and inquiries by one in search of the truth, rather than as the positive conclusions of one who has put his ideas to the test of actual experience. Yet, a life spent to early manhood on a farm and most of the remainder in working among a farming community, certainly leaves me in a position not altogether out of harmony with my subject. But, before attempting a direct answer, it would be well to inquire why such a question should be asked at all? Is there any necessity for discriminating between the sons of farmers and those of other men in the matter of education? The fact that the question is often asked and has often engaged the attention of thoughtful men, goes far to show that there is a deep conviction among intelligent farmers that matters in this regard are not as they should be. In other words, that there has been practically such a discrimination to the disadvantage of the farming class, yet without just grounds.

The reasons for this conviction seem to lie in the following facts:—1st. That the farmer does not wield his due share of political influence. It is a notable fact that while in this country the farmers outnumber all other trades and professions, yet more than nineteen-twentieths of the higher offices of government, both State and National, fall to the share of the non-farming community. 2d. There seems to be an overgreat and increasing tendency on the part of farmers' sons, to desert the occupation of their fathers and try their fortunes in other trades or professions, thus depriving the farming guild of much of its very best material. 3d. There is a general feeling that farmers, as a body, stand very nearly at the bottom of the social scale. For even here, with all our boasted equality, we find some remains of caste sentiment, and society almost spontaneously divides itself into classes. And, while it is a fact that many of the first families of the land are farmers, and by their intelligence, culture and business success have made their own position in society, it must be acknowledged that the majority of the farming population are obliged at present to occupy a somewhat obscure position, owing to the fact that either from misfortune or lack of enterprise, they fail to procure the means of culture, or having the means they lack the necessary appreciation, or taste, or energy to apply them in the right direction. So they may well say in the words of Cassius, "The fault, dear Brutus, is not in our stars, but ourselves, that we are underlings."

Now, we are ready to take the ground and maintain it, that there is nothing in the nature of farming as a business to account for all these short-comings. If farmers do not hold their share of the public offices, it is simply because they have not found a sufficient number of educated minds in their own ranks to fill these places well, and have chosen, of their own accord, men from professional and other walks of life on account of their superior fitness. If boys do not grow up on a farm with a taste for farm life, it must be because in some unnecessary way it has been made repulsive to them. Of course, I would not include here those boys who are born with a special taste and aptitude for some other pursuit, and whom it would be the worst of tyranny and very bad policy to attempt to confine on the farm. If farmers do not occupy a high position in the social scale, it is because they have set their mark low, and have not worked up very well even to that. From this criticism, lest I might seem unnecessarily harsh, I would except a large class in our new counties who are pioneers as well as farmers, and who occupy the greater part of one generation in a stern struggle with poverty, in the effort to obtain a livelihood and acquire a home.

But right here we take the position that there is no nobler vocation in which man can engage than farming. The products of the farmer are of prime necessity in the markets of the world, and rarely does he fail to turn them easily and promptly into ready money. All other occupations look to him for support, and when the crops fail they are the first to be pinched by famine. No other business comprises such a variety of operations or brings a man more closely in communion with the hidden forces of nature. All the various families of domestic animals are his associates and servants, and in the care and management of these he has opportunities for cultivating a breadth and generosity of soul scarcely to be found in any other pursuit. His daily work brings him into intimate acquaintance with the visible forms of nature in tree, flower, and fruit, and the various plants on which mankind depend for their daily bread; beast, bird, and insect, yea, the very elements, become by turns his friends or foes, as they may chance to aid or interfere with the accomplishments of his plans. No cramped position constrains his body till it becomes deformed; no monotonous movement compels him to cultivate one set of muscles at the expense of others. His lungs are strangers to the stifling air of factories, and the roar and rattle of countless wheels cannot disturb his ear or confuse his brain; but his work-shop is "all out-doors," and he breathes the free air of heaven. The robin and chanticleer sing his matins, and the whip-poor-will his vesper hymn. Rarely does his work extend into the night; as a rule his evenings are his own for reading and self-culture; and especially in the winter season he has unequaled opportunities for mental improvement. He is also, as a general thing, his own master, and when he chooses to take a day for recreation it is nobody's business but his own. And last, not least, in the quiet and comparative retirement of rural scenes he is, to a great extent, free from those temptations to vice and dissipation which constantly beset the inhabitants of cities and larger villages.

In view of all these considerations, I venture to claim that there is no other calling under the sun that offers better facilities for the symmetrical development of the whole man, morally, mentally, and physically, than farming. And farther, that in point of political influence, social standing, taste, culture, and refinement, the farmer's position may be whatever he shall choose to make it.

Now, I maintain, that in order to elevate your calling in public estimation you must take a manly pride in it. To make others respect it, you must respect it yourself. As the French say, you should cultivate an "esprit du corps." Associate yourselves as brother farmers, organize into clubs, discuss and adopt the best plans to advance the interests of the whole body and push them with all the strength that lies in union, to successful execution.

And here I will ask a question which reaches right into the heart of our subject:—What more direct and efficient means can be taken to elevate the standing of the business, to advance its true interests, to arouse an "esprit du corps," than to go systematically to work upon the rising generation and impress its members with a correct idea of the real dignity, importance and desirableness of their paternal calling? I think there can be none, and *this* I should consider the first step to be taken in the education of farmers' boys as such. We all know the true meaning of the word educate, namely, to lead out or develop all the latent capabilities of a man. It may also mean that special training of mind and muscle that gives him the skill and knowledge requisite to practice with success any particular craft or profession. We shall use it mostly in the latter sense, for we take it for granted that most farmers now-a-days have outgrown the old superstition that all the "larnin'" their sons needed to make them successful in life was a knowledge of the "three R's, Readin', 'Ritin,' and 'Rithmetic." The prejudice against agricultural colleges and agricultural papers, and "book-farming in general, is fast dying out; and when it is gone entirely, and the phrase "Scientific Farmer" becomes as common as doctor, attorney or professor, then we will see the brightest and bravest of the farmers' boys coming back from college or high school, and devoting theiir best energies to raising the standard of their chosen profession of agriculture. Then we will see more farmers sent to Congress, where they can look sharply after the interest of the farming community, share equally with others in the honors and influence of office, and lend the weight of their common-sense and practical wisdom to the councils of the nation. Then farming will rise above the servile and slavish drudgery it has been called, and will take on the rank and dignity of a profession, and will not only call forth into legitimate exercise the noblest powers and deepest learning of its votaries, but will also confer upon them proportionate rewards.

So I think there should be no discrimination for or against farmer's sons; they have the same right to a manly, liberal education that others have. I say nothing about the dead languages—leave that to taste. A man may have an excellent education and know "small Latin and less Greek." For practical purposes, I believe the time required to master Greek would be far better employed in studying history and the natural sciences. So much for education in the general sense, the amount of time devoted to it will always be more or less governed by the length of the father's purse and the taste and ambition of the boy.

But this special education is what we are after, mainly. How shall a farmer educate his boys that they will be in love with the farm, that when away to school or college they will return to it like a carrier pigeon to the home dove-cot? I think you will agree with me when I claim that if a man has succeeded in raising to a noble and useful manhood and womanhood a large family of children, he has accomplished a work of vastly more importance to himself and humanity than clearing up a new farm or amassing a large fortune. And we can hardly conceive of a more comfortable old age than that of the old farmer whose family has grown up and got well settled in life around him, one or more of them tilling the paternal acres and tenderly caring for the wants of their aged parents, and supplementing the weakness of their declining years with the strength and vigor of youth; and we cannot help feeling that the man who has failed in this respect has missed one of the most desirable objects of life. Yet how few realize in the early part of their life struggle the relative importance of these things. How many farmers I have in mind who willingly spend weeks and months of time and give their whole mind to the work of training their animals, but have allowed their boys to run wild!

Now I will venture to affirm that the farmer who goes round whining all the time and complaining in the hearing of his boys that farming is poor business; that it don't pay; grumbling about the weather; the shortness of the crops; the depressed state of the markets, and the poverty and hardships of his calling in general, and at the same time expatiating on the ease and luxury to be found in other walks of life, will not be likely to put them deeply in love with so wretched a profession. If those boys see their father come moping in from his work at night "like a quarry slave scourged to his dungeon," they will be very likely to look forward to their coming of age as a happy release from bondage; and indeed it will be a wonder if in many cases they do not take the underground railroad and emancipate themselves long before that period. So the first thing I would advise the farmer to do is to cultivate the habit of looking on the sunny side of things, and if he cannot always feel cheerful, try to appear so, and he will soon find that his example is infectious. Let him keep his grumbling inside, and ten to one his boys will never know there was cause for any. Let him remember that other occupations have toils, and troubles, and disappointments as well as his, and that the only way to achieve success and eminence in any line of duty is by a life of persevering labor and self-denial. Don't let him consider it time misspent that is applied to the serious consideration of this point, and the earnest and constant inculcation of this great principle upon the minds of his boys. Work, work, is the common lot. "By the sweat of thy brow shalt thou earn thy bread." If not with the hands it is with the brain, and the latter is often the more exhausting and burdensome of the two. He who tries to worm his way through life dodging this great law will require a special providence to preserve his honor, and prevent his being branded as a sluggard and dead beat.

Then I say let him take a manly pride in his profession and take pains to let his boys see it, always maintaining in their hearing its dignity and worth, and it will not be long ere they will manifest a similar spirit. As soon as they are susceptible to reason let him draw their attention to the advantages of farm life, and never begrudge an hour's time or a few shillings to enable them to reap the full benefit of these advantages.

Moreover, let me suggest, my farmer brethren, that no effort should be spared to make the farm home an attractive place to the young. I need but to hint at a few of the thousand and one ways in which this can be done. First let the boys, and girls, too, have the benefit of a good example constantly before them. The farmer who fails to furnish that to his boys, has only himself to blame if they do not turn out well. Boys are imitative animals, and during the first ten years of life are particularly impressible. If they are in the habit of hearing rough, harsh and profane language, they will be very apt to reproduce it. If they see the horses, oxen and cows cruelly whipped, kicked, and cursed, you will soon find them in the barn-yard repeating the performance on the calves and pigs. Indeed, it is so much of a truism that it is hardly worth while to state it; that if you wish to make a gentleman of your boy, you must *show* him how; *telling* won't do. Now, this is one way to make home attractive and also pave the way for the best results in the way of education.

Let an atmosphere of purity, kindness and genuine politeness pervade the home life and, my word for it, nine times in ten your boy will prefer home to any other place in the world. A little time and money would also be very judiciously expended in assisting your wife to make the living rooms of your house not only comfortable but even cosy and elegant. I fear it is more from lack of taste in this direction than lack of means, that many fail to do this. A nice front yard with shade and ornamental trees; a well kept flower and vegetable garden, aside from their desirableness in other respects, also aid to make home attractive and have a silent but powerful influence as educators. The refining and elevating influence of music also, as well as its social power, can hardly be overestimated; and now-a-days almost every farmer can afford an organ.

Much may be accomplished by spending your evenings, a portion of them at least, with your children. Any effort on your part to make the home circle pleasant and interesting will bring a tenfold reward. By early getting your boys in the habit of reading good books you are providing them with a means of improving their minds, and at the same time occupying those spare moments which are most liable to be misapplied. You know that when you once get a crop well started it will cover the ground and smother the weeds of itself. So if you fill a boy's time and thoughts with what is good the devil will hardly get a chance to put a word in edgewise. I firmly believe as the result of my own experience the best time to implant this interest in books is from two and a half to four years of age, before they have learned to read at all. When you return from your work in the evening you will (if you are as fatherly as you ought to be) always find "the expectant wee things toddlin' to meet their dad," and ready to climb on his knee and look and listen while he shows them the pictures in some book and talks about them, or reads some of the delightful child stories with which our juvenile literature so much abounds. And here, while on the subject of books, let me suggest that every farmer ought to provide for himself and family a cyclopedia, a Webster's Unabridged Dictionary, and a good, live agricultural journal, if he has to sell his best cow to do it.

Occasional participation with the children in innocent games, or the performance of any little simple experiments in natural philosophy, or the construction of scientific toys (if you have any faculty that way) will add much to the home feeling. The perfect confidence and clinging affection you will thus gain will be of immense value to you in the future management of a child, and may save him many a sharp reproof and yourself many a severe heartache. By showing that you can take an interest in the child's affairs, you are preparing the way to get him thoroughly interested in yours, when he gets a little older.

At an early age children should be accustomed to the regular and systematic performance of labor in some form or other. The farmer's boy, even when he is attending school, should have his "chores" to do night and morning. This might be called breaking him to the yoke; it accustoms him to the burden of responsibility and the thought that labor is a duty. With a little supervision and training he will in this way acquire that manual skill and dexterity which enables him to do certain things well and also leads him to take some pride in being really a help. A little praise and an occasional reward will act as useful stimulants if not overdone. I would deprecate anything in the shape of regular pay or wages to children as tending to develop a too selfish and mercenary spirit in them, as likely to become somewhat burdensome to the parents. I should consider it good policy to encourage them to cultivate a small patch of ground, or raise fowls, or in some other way, which their own taste or genius may suggest, earn for themselves a little pocket-money. This will foster a spirit of independence and habits of industry, and the money thus obtained will be enjoyed ten times as much as though it has been given by or begged from their parents.

These matters, however, should be managed at odd times, and by no means be allowed to interfere with the regular routine of farm work; for I consider it a lesson of paramount importance to be impressed early on the mind of every farmer's boy that farming is a regular business; that its calls for labor are continuous and exacting, and that it cannot be successfully carried on by "spurts." The results of such a system would soon satisfy him as to the question whether farming was a paying business, and would teach him the value of order, method, and precision. So the routine of the farm operations should ever move on with clock-work regularity, and only rare and exceptional events should be allowed to break in upon it. A slipshod method of management in farming, as in everything else, is almost sure to be followed by disastrous results, and I firmly believe that more bright, intelligent boys have become disgusted with farming and have abandoned it through witnessing this sort of thing than from any other cause. If every farmer would institute a system of book-keeping (not one in fifty does it), carrying an account with every field and every important department of his farm, he would not only increase his chances for successful results, but would open a most valuable, practical business school for his boys; for he should make them his clerks as soon as they can wield the pen. I think such a system, thoroughly carried out, would tend to inspire respect for farming, and advance it one long stride at least toward the dignity of a profession.

Great pains should also be taken to teach your boys the best methods of handling farm tools and performing the various operations that require manual dexterity. If you once get them interested in doing their work a little better and quicker than their neighbors you have them about won over; give them good tools. Nothing will breed a spirit of discontent sooner than to be put into the field with a wretched implement and expected to keep up with other hands. Make them early your confidants in the business of the farm; explain to them your plans, and when they get old enough to think encourage them to throw out suggestions which should always be carefully considered; and always let it be remembered that "come, boys," sounds far pleasanter to youthful ears than "go, boys." At a reasonably early age, even at the risk of a little loss sometimes, put your boys forward into responsible places and trust them with the execution of important business. This requires the exercise of some judgment, of course; but I have known farmers who went to the extreme of never trusting such matters as required any brain work out of their own hands. All bargaining or dealing, even common marketing, anything that required teaming away from the farm, must be done by themselves, while the boys were at home working out a "stent." As a consequence the latter grew up with no more idea of business than a Digger Indian, and the process of "cutting their eye teeth," as the saying is, was rather expensive and unsatisfactory when they got to doing business on their own account.

No farmer can afford to be without a pretty fair set of the more common carpenter's tools, with bench and screw, and if he is no carpenter himself it would pay him to hire one to give his boys some lessons, whenever he has occasion to do any building. The advantage of having a rough practical knowledge of the first principles of the carpenter trade will be of great use through life, and will soon show in the improved appearance of the fences, gates, and sheds about the farm. And if a boy has any natural knack that way, he will soon learn to make the wood-work of half the common farm implements. To be "handy with tools" makes a man helpful and self-confident, and fertile in expedients that will many times carry one through a tight place. I feel proud to say that the boys of the Northwest have not been, in times past, behind their neighbors in this respect, as the records of the late war will show. We all know that when the generals wanted a big job of pioneering done, roads opened, rivers bridged, or camps constructed, the sturdy backwoodsmen and lumbermen of Michigan or Wisconsin were pretty sure to get a call.

The farm, in its vast variety of operations, gives a splendid range for the cultivation of ingenuity. And surely the best fortune a father can leave his boys is the ability to shift for themselves. A pair of well-trained hands are the best servants a man can have. One whose hands are awkward and unmanageable, always getting hold of things by the wrong end, soon becomes disheartened and discouraged, and instead of "paddling his own canoe," with bold and steady stroke towards the golden shore of success, he is apt to lean idly on his oars and suffer the tide of fortune to drift him whithersoever it will. So the good farmer will have no tolerance of "puttering." He will insist on his boys handling their tools with something of the dexterity and precision with which a well-drilled soldier handles his carbine, even although, in these days of machine farming, manual skill is of less importance with reference to results than it used to be.

Of course, no farmer boy's education should be considered complete till he has mastered the arts of grafting, pruning, the general care of orchards and their products, culture of grapes and other small fruits, management of bees, plowing neatly in straight lines, sowing by hand of grass, grain, and root seed; taking levels for ditches and drains, the management of the latest farm machinery, the training of horses and cattle, the chemistry of soils and manures, the theory of the rotation of crops, how to run a dairy, and last not least, how to milk a cow and keep all filth out of the milk. It ought to be next thing to a capital crime for a boy to be caught manipulating the dugs of a cow without having previously washed them.

I think every farmer's boy should get all the benefits of the district school, summer and winter terms, till he is 13 or 14 years of age, then winter terms till he is 18 or 20; and if during this time he could pick up some knowledge of parliamentary rules in a debating society or farmers' club it would be of great advantage. A few terms in a high school where chemistry, natural philosophy, and book-keeping would receive especial attention, would put him on a higher plane with respect to his profession; but better still, if he could get a full course, or even a year, at the State Agricultural College. At that institution he will learn broader ideas in regard to the philosophy of farming than he can get anywhere else, and at the same time be acquiring practical accomplishments that will fit him to adorn any station in life. Meanwhile the three hours' daily work on the college farm, that runs along parallel with his studies, keeps his hand in skill, his body in healthy exercise, and his mind from falling into the delusion so apt to overtake students, that there is something ignoble and degrading in manual labor.

And right here I take occasion to arraign our whole system of education as being too impractical, and advance the claim that the Agricultural College is a step in the right direction. I believe the day will come when every union school in the country will have an industrial department connected with it, and I do not look for the best results in the way of education till intellectual and industrial instruction—theory and practice—shall walk along hand in hand. That was a grand old Jewish law, well worthy of imitation to-day, that required every father to see that his son was taught some handicraft or trade. Were that law now in force among our people, our jails and workhouses would have fewer inmates, and we never need have any fear that the national balance of trade would be on the wrong side.

But in all your earnest efforts to prepare your sons to be grand and useful men as well as farmers, and at the same time avail yourselves to the utmost of what help there is in them, don't forget the words of the old proverb, "All work and no play make Jack a dull boy." Remember the principle that relaxation and recreation are as necessary to the proper growth and development of mind and body as sleep itself. But I need not enlarge upon this point; it is pretty generally understood.

Perhaps the thought will occur to you that the farmer with a family of sons who follows out all these suggestions will have a busy life of it, and so he will. There will not be much time left for him to sow wild oats or even to indulge moderately in many of the so-called pleasures of the world. But I think he may console himself with the reflection that in performing all these life-duties well and manfully in their proper time, he is really laying up a store of delightful ease and comfort for that declining period of life when he may expect to stand in need of something to lean upon.

And now in closing, I would state, by way of summing up, that the following conclusions would seem to result from my somewhat rambling discussion: First, That the best education, generally speaking, for farmers' boys, is that which is most thoroughly practical; 2d, That in order to keep your most enterprising and ambitious boys at home on the farm, you must convince them that farming offers equal inducements with any other calling in the way of mental culture, social standing, political influence, pecuniary rewards, and general usefulness, which, I take it, are the several motive objects which usually govern young men in the choice of a career; 3d, To accomplish this you must raise the standard of the agricultural profession till it becomes thoroughly rational and scientific, which must be done by strenuous individual and combined exertion, and the systematic education of the young; 4th, To fit your sons to properly represent you in the State and nation, and thus enable you to hold your own upon the statute book. You must give them both business and scientific training; for he who has never kept accurate account of his own finances will surely make bad work when he comes to handle those of the public, and he who has only worked by routine, never looking beneath the surface of his chosen profession, will make but a sorry statesman.

Finally, let me remark that I believe we present the first example in the history of the world of a great nation in which the mass of the population consists of small farmers who own the land they occupy. The down-trodden peoples of the old world are watching us with anxious eyes, and stand ready at any moment to break out into revolution and sweep away the old feudal tenures. If this experiment of ours is a success, our nation is a success, and a new era of liberty and hope for the laboring masses has dawned upon the world. It has been well and truly said here to-day that the prosperity of the farming community is the prosperity of us all; having a profound sense of the truth of this remark, I can but say that I shall feel amply rewarded for this slight effort of mine, if what I have said shall awaken in you a little more enthusiasm in advancing the interests of so noble a calling—a calling which in its very nature tends so largely to preserve that grand spirit of independence which has always been so marked a characteristic of the American people.

THE FARMER'S HOME.

BY F. C. SNYDER.

[Read at Greenville Institute.]

What mingled associations of happiness and sorrow, blight and growth, are bound up in the word home. How definitely we can point back to childhood's hours, and trace the windings of the pathway of life that has led to present success or failure,—a pathway we are permitted to travel but once. All along the way are its bright scenes and its dark. The bright are as sunshine, casting its quickening and life-giving rays down life's rugged pathway to its very close. The dark are but chilling shadows ever remembered with regret. From within the sacred precincts of home have been gleaned the many precepts and lessons that have moulded our minds and character; fitting each, either for work in the cause of advancing or that of retarding the highest, noblest interests of manhood. What importance then centers in that place of all places,—the *home.*

While we are so earnestly discussing the various merits of different breeds of live stock, the best modes of raising crops, and studying perfection in various farm operations, may it not be of profit to consider the question of the farmer's home?

Let us put the direct question, and ask what that home is? Is it a tumble-down, rickety, weather beaten shanty, whose very surroundings betoken shiftlessness, disease, mental and moral debasement? Again, is it a huge building reared within ten or fifteen feet of the road, its blank, glaring windows staring down on the passer by, with not a flower, shrub, or tree about, to cheer the lonely aspect? A place bespeaking physical toil from early morn to late evening, year in and year out, with but few or no hours devoted to mental and moral culture?

In short, *is it* a place calculated to produce and foster the many noble graces and qualities of mind and character that constitute the highest conception of true manhood and womanhood? We fear it is not always the place we can point to and say with pride and pleasure,—I love it, it furnishes food for the soul, for the intellect! Else why do the boys find their way to the cities in search of enjoyment, only to be plunged into sin, and often becoming its victims, why do the girls sigh for escape from farm life, and why the good farmer and his wife denominated rusty, simple-minded, slow paced beings?

Farmers, it is in our homes we must look for the richest product of the farm! It is the eminent philosopher, Sir Wm. Hamilton, who says: "There is nothing great in the world but man, and nothing great in man but mind." The history of ages but proves the assertion. If we wish to share in the offices of the government; drive fraud, dishonesty, and injustice from the land; rid society of the blasting sting of sin; hunt out the hot-houses of iniquity, and scatter its occupants to the winds, it must be through the cultivation of the mind. Every hour reveals the emphatic need of strong, active, healthy intellects, with unimpeachable characters to back them. Yes, the world is large for such, and great is the reward offered.

The training for the laborers in this field must center largely around the family fireside. It is here that youth must derive strength; old age a sure stay in declining years. The homes of the nation are the anchors of State when storms overwhelm it. Here both young and old meet on unreserved terms, giving and receiving instruction. Here is gathered and moulded for use, material with which to arm ourselves for public duty. How jealously ought we then to guard this vital spot; provide for its thorough tillage, that it may bring forth an abundant harvest.

Yet, farmers, are we fully alive to providing means and surroundings that will furnish the highest results in our homes. Are we not too apt to look to our fields with a single eye to garnering gold, laying it by for starting the children in life? Losing sight of the fact that the development of a refined moral and intellectual character is the only abiding treasure, the greatest legacy we can leave the children at death?

Having in view then what the farmer's home is too apt to be, and the importance of zealously cultivating our minds as well as our fields, it yet remains for us to inquire into what the surroundings of the home should be. In other words, what are the best means to be adopted in bettering its condition, that it may yield the required returns.

It would be folly for us to lay down rules that should bid you get this and that ornament for the home; plant such and such shade trees; lay out your walks on a curve so and so, or say you should read this and that literature. No, we shall be wholly content if we can but set each to thinking seriously in regard to the matter, thus, perhaps, tending into the right course of action.

Let the ideal home be set up in the mind, and strive to attain the real as circumstances permit. But let me urge above all things, to be active. Is the front yard bare, destitute, unattractive? Then plant shade trees, shrubs, and flowers. Is the back yard filthy, unsightly? Then clean up. Are the buildings shabby, the fences crooked and tumbled down? Then straighten up and repair. Are your tables and shelves destitute of entertaining and instructive literature? Then provide, and see that it is used. Let music find its way into the home; works of art, pictures; in short, leave no stone unturned that will tend to beautify, cleanse, and make it a place where intelligence, peace, and love prevail. If the good farmer wishes, in this country and age, to raise successfully a crop of wheat, it is hardly expected that he will loosen the soil by spade, sow the seed by hand, and cover it by means of a three cornered harrow. No, he must use improved implements. So in the field of the mind there must be improved instruments to work with, and these applied skillfully, that the home may produce an abundant harvest.

There must be that in our surroundings to stimulate the sense of the beautiful, if that part of the mind would develop. Kind words, love, and generosity must be the instruments used if the good would prevail. Honesty and justice must be awakened and nourished through precept, and if knowledge is sought, there must be approved means for accumulating it.

To secure the perfect home, money, time, and energy are required, and we are prone to excuse ourselves from the duty of providing suitable means for its culture. Yes, it does require money, time, energy, and so does a bushel of wheat. And, yet, can one—yes, can *ten thousand* bushels of wheat redeem the lost or degraded character of a son or daughter? Can money purchase intelligence, love, and sympathy? Most certainly not. Why, then, hesitate and count the cost? Ought it not to be our first duty to provide for the development of a true home, where may be found the graces, accomplishments, and qualities of mind that constitute ideal manhood?

The farmer has many advantages that aid to make the perfect home. His is a home removed to a large extent from the evil influences ever lurking around and making deep inroads of blight into that of the most guarded and cultured city home. Again, there is much time for quiet thought and meditation. And, above all, there is that development of the physical man so essential to the intellectual. The farm is the work-shop that furnishes the iron constitutions which, combined with culture and intelligence, make the ideal man. From the free, bracing, health-giving atmosphere of the farm have been reared the foremost men in trade, manufacture, and the professions. It has nurtured the youth of the noblest statesmen of the nation. Men whose strong constitutions enabled them to battle heroically and successfully in life's field of action.

It lies with us farmers whether we will improve these advantages. May we not add to strong frames cultivated and refined minds, thus realizing the highest, noblest state to which man may attain? Are we justifiable, then, in idly excusing ourselves for not providing and using all those means that contribute to an ideal farmer's home? One where peace reigns; love for the good, true, and beautiful abound; and where intellect, that powerful agent in society, is administered to, yielding an abundant harvest of rich thought.

Let us then be astir. Eradicate foul weeds that may be choking that good crop the home is designed to bring forth. Let in the sunshine of kindness and love, dispelling the blight of discordant words and deeds. Plant the seeds of honesty and uprightness. Finally, provide nourishing food for the symmetrical development of both mind and body. A rich reward awaits our every effort in this field of labor. The blessings of society, the State and the nation will be showered upon us, and we shall have contributed to the rich store of knowledge and refinement that marks the onward march of civilization.

WHAT SHALL WE DO WITH OUR STRAW?

BY GEORGE L. SHELDON, OF CLIMAX.

[Read at Galesburg Institute.]

I think you will all agree with me, that dry straw is the most valuable. In that case, if this paper proves rather dry and uninteresting, remember that the subject assigned me must be a dry one. There are several kinds of straw: oat, barley, wheat, and rye; their nutritive value in the order named. To feed, wheat chaff is twice as valuable as the straw; oat and barley chaff are not quite equal to their straw, by analyses which have been made. The writer thinks that there is but one answer to this question, "What shall we do with our straw?" And that is to convert it into as rich manure as possible.

We, as farmers of Michigan, must grow larger crops per acre each year, in order to compete with the West. Barnyard manure is the cheapest and best mode of doing this, and our straw stacks, when properly handled, afford the best means of making this desired increase in our crops. English farmers claim they can buy oil meal exported from this country and feed it to their stock for the increased value of the manure. We, as farmers, by preserving our straw bright and sweet, can feed it with a little more grain than if feeding hay, and convert it all into rich manure. If we have not sufficient stock to work up all of the straw, we can afford to purchase more. One of our best practical farmers, who feeds a large number of sheep each year, says that he shall continue to feed sheep as long as the manure made costs him no more than the labor of feeding them; he asks for no other profit, but thinks he is seldom obliged to content himself with that amount.

We commence cutting our wheat as early as it will answer—quite green. Prof. Kedzie is authority that it can be cut much earlier with profit than is generally supposed. We found this season ours cut first and threshed from the shock overran three pounds per bushel, while that cut later, stacked and threshed after seeding, just held out; it was all secured before the rains. The straw is much more valuable when cut early. Hay and straw are practically almost the same crop but cut at different stages of growth; straw is cut late when much of its nutritive value has passed into the seed. When grass is cut very late or exposed to rains we find our early cut straw preserved in good order fully equal to the hay; analysis and experiments prove this assertion to be correct. We generally seed down all of our wheat to timothy about the middle of October, sowing clover seed in the spring; then a good deal of the timothy heads out and is cut with the wheat, increasing the value of the straw as a fodder. Wheat, when sown broadcast and thick, is more valuable for its straw, as it is finer and more leaves being less exposed to the light and air. We try to shock and stack our wheat securely to better preserve the grain and straw, drawing all the straw to the barns in the bundle, believing that it can be done then cheaper than in the winter. When threshed we try and have it properly stacked, frequently paying a good stacker one dollar per day extra and furnishing plenty of good help to assist—not all boys—on the straw stack. Whenever a stack is to be placed at the barns where stock can have access to it, we build a straight rail fence and have the straw stacked inside of it, as cattle waste a great deal when allowed to run to the stack, and sheep get their wool full of chaff, which injures the sale of it. We feed straw to our sheep by carrying and placing it in racks, and think the sheep are best adapted to feed straw to, as by their small lips and pointed mouths they can better pick out the wheat heads, chaff, leaves, and finer portions of the straw which are twice as valuable as the coarser parts; when sufficient is placed before them they only pick out the best, which is nearly equal to hay. When straw is scarce as it was a year ago, it is a good plan to place it before them in large quantities, allowing them to pick it over, then using what is left for bedding. We feed some straw to the horses in the winter when not working much; also feed our cattle straw with good results, adding more grain than if feeding hay, and think it cheaper; we thus increase the quantity and value of the manure. We use straw in sufficient amount for bedding to keep stock clean and absorb as much of the liquid manure as possible. It has been found by experiments that about one-half of the straw is digestible, including crude fibre; but it is best digested by the ruminants. Straw which has rusted or mildewed is unfit for fodder. Straw grown upon rich, well manured land is more valuable as a fodder.

We have had but little experience in plowing under dry straw; our best results have been obtained in heavy soils in a wet season; think it makes the soil more open and porous; coarse manure would have given better results;

would prefer to have straw plowed under dry than burnt, as that can not be afforded any longer, nor is it policy to sell it off the farm unless its equivalent is returned to the farm in barnyard manure. I am indebted to Prof. Armsby of the Connecticut Agricultural Experiment Station in his "manual of cattle feeding" for some of the information in this paper. As the grain which which grows upon the straw is the best part of the plant, it is desirable that in the discussion of this subject it may be thoroughly shaken up until all the wheat is sifted out (provided this paper contains any of that best portion) and made profitable to us.

THE MILLENNIUM OF AGRICULTURE.

BY IRA H. BUTTERFIELD.

[Read at the Armada Institute.]

Agriculture, in these days is a progressive calling. It has ever been a thing of growth; the progress has been slow, but perhaps co-equal with the growth and progress of all the material world. It was no doubt intended by the Creator that ages would be required for the full growth and ripening of all material things, as well as of moral, and we must not expect too soon to reach the goal of our ambition, in relation to agriculture.

The first calling to engage the attention of man, it will also be among the last; at least, so long as there are bodily wants to provide for must he cultivate the soil. It has been the vocation of man from the beginning. From his Creator he received instructions to dress and keep the garden. Even among the spontaneous growths which pervaded the gardens of paradise there was work to do. It may be that weeds did not then grow, choking fruits and flowers to the annoyance of the husbandman, but even there the soil needed stirring for the easier penetration of the minute rootlets, and that it might more thoroughly absorb and retain the moisture. Trees, from their luxuriant growth, needed the hand of the trainer and pruner. Now, weeds compel the cultivation and dressing or the crop is cut off, even from a fertile soil; a blessing in disguise, no doubt, but hard to receive. "In the sweat of thy face shalt thou eat bread," although no surer inheritance to the farmer than to other toilers, is a command he will always remember.

It is hardly necessary to trace the progress of agriculture all along the centuries, from the first to the present. It is sufficient to say that the progress has been slow but constant, sometimes retrograding in periods of the world's moral darkness, and again coming forward when light dispelled the gloom; but it has been reserved for the present century to witness the greatest strides in this, in common with all other industries, greater in many respects than in all the other centuries combined; to see it placed on a higher plane in the general estimation than has ever before been permitted.

In view of what has come to pass in the last fifty years, may we not look for continued advancement to come. Things that are possible to us were quite impossible to our fathers, and who can say there are not still greater heights to scale before the summit is reached. There may be a limit to human knowledge and human energy, but we have not attained to it. In that thousand years to come we expect the millennium, when the moral nature of man shall reach its most perfect state in this world; so, too, may we not look for a millennium of material and intellectual interests; when wars and strifes shall cease and all the arts of peace shall be foremost, when man shall attain his highest condition—physical, intellectual, and moral—may we not also look for a period when all the noble industries shall have their millennium, when *agriculture* shall come to its best condition and reach its highest state, when every farmer may be a thorough student of nature, working in unison with her immutable, no longer a mere delver and drudge, a "hewer of wood and drawer of water" to the other industries; no longer seeking from an infertile soil a precarious subsistance, but improved and strengthened by greater knowledge, rising above natural conditions, bringing barrenness into fertility and making waste places to wave with abundant harvests. No more taking from a fertile soil its best and most accessible elements and appropriating them to his own use, borrowing, aye, stealing from the future, taking for himself what of right belongs to future generations, that which he simply holds in trust, and using it for his own advancement, without even thanks, with no compensation. Such are some of the farmers of this day; pirates of the soil, receiving but not giving. This is that increasing that wasteth away.

Man is not nature, nor a part of nature; he is above nature, and in nature he finds materials which he can mold at his will. They are governed by immutable laws, and the discovery and application of these laws is man's work. If we look at this earth and man's relation to it, physically, intellectually, morally, and spiritually, if we consider that the earth is the storehouse of all the materials of man's progress, civilization, and refinement, from the dark and shapeless stones of the mountain to the marble halls reared by master builders; if we reflect that all the material of man's labor and adornment and wealth and comfort, from the rude tools of the barbaric tribes to the wonders of modern mechanism, from the spontaneous growths of nature to the rich nutritious products of cultivated fields and gardens, and whatever in material, condition, and power distinguishes the civilized man from the savage is from the dark, sleeping yet bright and wakeful earth, we are impressed with the susceptibility of what we call nature to the touch of man. A wilderness blossoms as a rose, a desert is changed to a fruitful field, and the rock pours out rivers of oil.

When we look at this earth whose products are so important to human welfare, and think of its having within its own heart the materials of which this fair fabric of human society is constructed; from the blocks of wood hewn out of the forest, to the matchless bodies in which our minds live, and that it waits only the touch of man's spiritual nature to transform it and bring forth its latent powers of life, and use, and beauty, we are impressed with the idea that the world is imbedded in mind.

While we are attracted by and feel so vividly the magnificence and sway of superior kingdom, we need to be reminded that nature by nature has no power to develop itself into working powers of life and beauty, and that the contact of mind is everywhere required to bring out and unfold to its highest excellence what is in nature. We need to be continually admonished that the constant presence of mind is the power that awakes and develops nature in all her realm, and that man in his relation to what we call nature, is supernatural.

Of course, the boundaries and limitations in this relation are obvious. It is not to be supposed or assumed, that man's dominion over the earth, his control of its products, his power to modify and change the world, fill out or answer to the idea of the supernatural in its full scope. The supernatural in its highest and supreme display is the influence of the Infinite mind upon the finite mind of man. But the supernatural has grades and degrees of manifestations, and the power of man as a superior being over the earth, his power to to change a desert into a fruitful field, to make the flinty sides of the mountain green and fresh with beauty, and rich with the purple blood of grapes, the power of his intelligence which enables him to cultivate a wild, coarse plant from a comparatively useless and immature state to be the daily food of nations, thus contributing to raise mankind from barbarism and want to refinement and comfort; his ability to construct from the trees of the forest, and from the iron and stone that he digs from the earth, comfortable dwellings adorned with works of beauty and use; to overcome in a large measure, the natural elements, and train the great forces of nature to do his bidding; in short, the power and influence of man's spiritual nature to carry forward natural things to higher excellence, and to bring out the *possible* world that lies dormant and hidden in the *actual* world, is the supernatural on this plane; the imposing of a power above upon things below; and it also illustrates the supernatural in its supreme display. This is progress.

If the American farmer of to-day has a better plow than the Egyptian had, it is not because of any law of nature, but because of a law above nature originating in an intelligent mind and will. If you can raise ten bushels of corn on an acre of land in its natural state, and fifty bushels on the same land cultivated, it is not nature nor any law of nature that makes the extra forty bushels, but nature directed by your will. The laws of nature are material for man to work with, just as much as stone or wood or iron, and unless they are used, appropriated, they are like any other raw material—they lie where they are.

God works in nature but he does not do everything, and he utterly refuses to do anything more, until man does what belongs to him. What did nature do towards making Bidwell strawberries, Bartlett pears, Clawson wheat, Peachblow potatoes, or Shorthorn cattle; just the same that she has done towards making a wagon—she furnished the raw material—and it is man's labor in working and combining these materials in unison with nature's laws, but guiding and controlling them by his mind and will, that makes up the sum of the world's progress.

Agricultural progress, its methods, aims, and results, is the theme of my remarks at this time; and also to point out the conditions which shall indicate the highest progress, the coming of the millennium of agriculture.

And first in our dealings with the soil. Our lands have been so recently reclaimed from the from the forest with the accreted wealth of centuries in the soil, that we have as yet scarcely realized that there is a limit to the elements of fertility. Increased cultivation has added to the products, but we have hardly taken into account the fact that this made the spoliation still more complete, and just in proportion as larger crops were induced.

The older nations who have cultivated their soil for a thousand years, and have turned and touched every particle, have learned that it is necessary to return the proper elements back to the soil to insure prolonged fertility. If they have not done this, barrenness has come, and the once fruitful fields have become desert wastes. They well know that the earth will not continue to produce for them if they give nothing back. It is an almost unlimited storehouse, yet not inexhaustible, and they husband everything that will preserve or increase the fertility of their soil. Fertilizers of all kinds, mineral, animal, or vegetable, are eagerly sought and judiciously applied. It has been charged to England that foreign battlefields have been spoiled of bleaching human bones, to enrich English soil. Certain it is, that she has sought all lands for food to be consumed within her borders for both man and beast, the refuse to enrich her soil. She has bought food from America, guano from Peru, and the refuse from mines all over the world.

The European farmer knows well the value of manure and the importance of saving it. But in this country we have treated the soil as a vast mine from which to gather all that was possible. The soil is new, and in its pioneer state the first business is to clear and subdue it. The farmer must first make his living, and he often crops the land more than he ought. But as time passes this necessity does not exist, nor is it allowable. As soon as the soil is relieved of its burden of timber and the coarse vegetation is decayed, must the work of reparation begin. It is not best to wait till the crops fail. It is not only wasteful of materials, but it is unprofitable as well.

Hon. C. C. Andrews, of Minnesota, in a long and exhaustive report on the condition and needs of spring wheat growing in the northwest, after giving reports from a large number of prominent farmers in the wheat growing sections, draws these conclusions: "The opinion was universal among those consulted, that the yield of wheat has generally been growing perceptibly less for the past ten years. In a few localities the decline is attributed to chinch bugs; in others it is claimed that a change has occurred in the climate, that the summers are warmer than they were twenty years ago, and that the higher temperature is injurious to the crop (it is very natural to charge the season with cause of failure of crops)." The prevailing sentiment, however, was "that much of the trouble was owing to a continued growing of wheat on the same land year after year, without doing anything to replenish the soil."

The majority have, in this case, undoubtedly found the true solution. Statistics show that in Iowa, the spring wheat crop in 1870 averaged 13½ bushels per acre, while in 1880, it was but 10.21 bushels—a reduction in yield of three bushels per acre, or more than 20 per cent. In Minnesota, in 1870, the average yield was 18.75 bushels, which, in 1880, had decreased to 11.33 bushels, a loss of 7.42 bushels, or nearly 40 per cent. In Wisconsin, the average in 1870, was 15 bushels; in 1880, 12.82 bushels, a decrease of nearly 15 per cent.

A recent article in an agricultural paper defended this wholesale piracy, as I shall term it, on the ground that it paid best for the present, and that as Americans had always found a way out of difficulties, so would the next generation take care of themselves, even if they were robbed by the present. But does it pay? How long can the present generation endure the decrease in wheat yield under the present system in the northwest, which, in Minnesota, has in ten years, according to the figures quoted, been 40 per cent? Not long, I conclude. The end will come all too soon, even for the present owner.

Hon. Horace Capron, while Commissioner of Agriculture, said in an address at the Illinois State fair in 1870: "Your soil is wonderfully fertile; you may be disposed to consider it inexhaustible. It is an injurious, if not a fatal, error. Statistics of production attest that repeated crops of wheat on your best lands show rapid deterioration. Every crop taken from the soil with no return, reduces the capacity of the farm for production in arithmetical ratio, and its capacity for profit in geometrical ratio. Such a course may, for a time, give you a little more ready money, but you are certainly robbing your heirs. It is doubly difficult to renovate them; how difficult, you can only realize after a trial. I have had full experience of this in Maryland, having brought the value of a thousand acres, after years of toil and labor, from $10 to $60 per acre, and repaid its cost. The difference in its original and improved yield during that period which represents the measure of loss by former mismanagement, would have been a fortune in itself. It has been estimated that 100,000,000 acres of these lands have been thrown out of cultivation in the south. Beware of a similar experience in the west. You are on the road to the same ruin, which can only be averted by prompt use of restorative agencies, and the exercise of an enlightened judgment in all the operations of agriculture."

An agricultural writer says: "There are some peculiarities of season which render the cultivation of wheat quite as profitable, and even more so on light soils than on heavy ones; still, on an average of years, the firm, deep soil retains the preponderance. Here is, however, another truth of far higher importance, in a practical point of view, than that involved in an inquiry into the natural capabilities of various soils for growing wheat; and this is the fact, that with few exceptions nearly every kind of land, whether composed of clay, chalk, gravel, or sand, will produce paying crops of wheat if drained, cleaned, and brought up to a certain pitch of fertility, by high farming,—a term which comprehends three principal operations, namely, relieving the soil from all superfluous water by drainage, ridding it of weeds, and filling it with manure in a solid or liquid state." This only refers to wheat, but I take it that all other crops can be grown in the same manner. Dr. Madden, in his prize essay on the question, "What has science done for agriculture?" lays down, among others, these two propositions: 1st. Cultivated land, when properly taken care of, gradually becomes richer and richer notwithstanding the increased quantity of produce annually removed from it. 2d. If the same plant be cultivated for several years successively on the same spot, the soil much more rapidly deteriorates than when a variety is kept up. A popular succession of crops in England is the four-fold or Norfolk system, in which half the arable lands are in grain crops and half in cattle, or forage crops annually. The merit of this course is held to be that its main features can be retained, and yet extensive variation be introduced in its details. Mr. Caird gives as his opinion that the average product of wheat per acre in twenty-six of the thirty-two counties in England visited by him, is 26⅔ bushels per acre; which is 14 per cent higher than it was estimated at in the same counties by Arthur Young, a century ago.

An English farmer, said Mr. Webster after his visit to England, looks not merely to the present year's crop. He considers what will be the condition of the land when that crop is off, and what it will be fit for the next year. He studies to use his land so as not to abuse it. His aim is to get crop after crop, while still the land shall be growing *better* and BETTER.

CULTIVATION.

Another great element in the way of progress is better cultivation. This is never to take the place of fertilization, but to go with it. We have too much regard for the idea that the number of acres cultivated measures the importance of our farming. This is not true. The market gardeners, who fairly cover their land with manure, drain deeply and so thoroughly cultivate that they often require the labor of one man for the season on a single acre, raise crops that would astonish the average farmer, and at the same time make it pay. A prominent farmer in northern Ohio lately wrote to an agricultural paper, that "on his farm during the last three years, an addition to the amount of six dollars per acre in value of labor in cultivation, has added, on an average, fifteen dollars per acre to the product of his wheat crop; and this, on a soil already well cultivated, and producing twice the State average of bushels of wheat per acre.

In cultivation we can show great progress for a few years past, and for the ease with which it can be done, we are greatly indebted to the inventors and manufacturers of agricultural implements. We now have a good tool or implement for nearly every operation on the farm. Twelve years after the landing of the pilgrims there was not a plow in the vicinity of Boston, and the farmers broke up their land with hoes and other hand implements; and in 1637, there were but 37 plows in the whole province, and these such as no one would think it possible to use at the present time, and this after fifty-six centuries of the world's history, as we record it. The improvement was very slow till 1819, when Jethro Wood invented his plow, and you who knew the plows of even thirty years ago, mark the progress to the present steel or chilled-iron plow, ground and polished as it comes from the shop, in the place of the rough casting that used to take from one day to a week to become "scoured" and smooth for work; all this time trying to the temper of the plowman and worrying his team.

We have leaped in one lifetime from the sickle to the self-binder; from the flail to the steam thresher, and it looks at times as if we had reached the very acme of perfection; but the inventor is tireless and improvement still continues. Doubtless, in the future, steam and even electricity will furnish motive power for many operations in agriculture. In farm implements we are ahead of any other nation. In England there are many good tools and implements, but they lack the lightness combined with strength that our tools for hand use possess.

The Germans are often quoted as possessing many elements of progress in agriculture. They are thorough in cultivation, saving of fertilizers, and careful feeders of stock. They are advanced in support of agricultural schools, and in scientific investigation in all matters pertaining to agriculture, but a gentleman who is well known here, and who has lately traveled in that country, President Welch, of the Iowa Agricultural College, in a recent letter says: "I found the Germans using the same kind of tools that their fathers had used before them, and their grandfathers, and for generations back."

In Holland, the seat of very early civilization, a country rich and prosperous, the farmers seldom leave their provinces, and are very slow to receive or adopt new methods or new tools. They still have no thills or tongues to their farm wagons, and cut their grass by hand.

True, all that is new is not improvement, and the American farmer by his readiness to accept new things is often wofully humbugged; yet this fact opens the way for great improvements which would not otherwise be adopted. It is often remarked that new and improved tools and machinery to stock a farm are costly and require too much capital invested, but the best farmer will still find it more profitable to procure a full complement of tools and implements and invest still farther in providing a place to keep them when not in use, always in good repair and ready for use, or to lend to his less thrifty neighbors; the latter use does not pay a profit. A single day's use in just the nick of time will often save an amount equal to the interest on the investment for one year.

The three great working elements which enter into profitable farming are cultivation, manuring, and drainage. With these combined the industrious farmer may smile—yes, almost bid defiance to drouth or wet, and will, with no other effort, triumph in a great measure over insect pests, for the crops will grow so strong and luxuriant that these cannot injure them.

Another method and evidence of progress is the increase and dissemination of improved stock. This, until within a few years, has been slow, partly from lack of capital to purchase; more generally from a disposition to stick to the old ways. If he who makes two blades of grass to grow where only one grew before is a public benefactor, so, then, is he who grows a double quantity of meat or wool from the same source from which one portion has heretofore been obtained. Farmers have been slow to perceive that it was more profitable to keep the best stock. They considered them a luxury that might be indulged in by those who had money, but were not profitable for general use. Before the farms were improved they were in a measure right. There is but little room for choice stock until the farms are ready to receive them. Improved stock follows, not precedes improved farming; indeed, it is hardly possible to keep them without it. The improved farm must come first, but the two work admirably together. The farmer who introduces choice stock into a neighborhood or township must expect for a long time to be a kind of missionary in stock raising, giving to the public more than he receives. Many of the men who were pioneers in improved stock in their localities can understand and appreciate what this means. Choice stock breeding and feeding does not belong to careless ways and barren fields, and while it follows improved agriculture, it is at the same time great evidence of progress. It requires skill and untiring attention. There is still much to learn in this branch. Already has too much stock-breeding been carried on from an esthetic point; at least I will call it by that name. Beauty before use will not do for stock that is intended to help produce the income from the farm—true progress in stock indicates value. Many have been induced to buy improved stock simply because they were handsome in form, and have bred them solely for beauty of outline without any thought of making them more valuable, or with the intention of producing more beef, or milk, or wool, or weight for food consumed than was obtained from the old stock; and in too many instances the useful qualities have been entirely left out, and the feeling shared by the masses that good stock was not really more profitable has proved too true. We have heretofore been behind the farmers of Europe in this respect. They have kept improved stock because they were obliged to do so to pay their rents and expenses. It is fortunate, however, that usefulness and profitableness are not inconsistent with beauty of form. This is well, for the progressive farmer will demand that stock have some qualities which merely gratify the eye, and which he could not sacrifice even to utility. I must give the American stock-breeder credit for sticking to his point in some instances till he established permanent improvement in a breed. He has changed the old Spanish into the improved American Merino, the best specimen of a fine wool-growing sheep in the world. He has absolutely made the now standard trotter the most speedy and enduring of his kind, and in some classes of swine and fowls has established an almost perfect and permanent standard.

But the handsomest type of the Merino should be that which gives largest fleece of choice wool from the same size, combined with vitality and vigor. You cannot sacrifice fineness, or length, or evenness, to a fancy wrinkle, but if you can keep all these and still obtain the wrinkle so much the better. The beef-producing breeds of cattle must represent the greatest weight of the best meat in the shortest time and on the least food, and all this not incompatible with strength, health, and vigor of constitution. The Jersey must not be run into solid colors, and black points, and special strains, without reference to butter product, nor the other dairy breeds into anything than the largest milk product from the least food. The draft horse does not need mere size of body and smoothness of form; he needs bone and muscle and muscular action, with patient temper and endurance; the roadster not alone for beauty of form, but for strength, speed, and endurance. After all, much that is called beauty is but skin deep, a mere matter of preference at that. "Handsome is that handsome does" is a good motto for the stockbreeder.

Some think that we have nearly reached the climax in our most perfect specimens of the best breeds, but who is able to set the standard beyond which we cannot pass. One who had never seen but a Shetland pony, or Texan cattle, or a Mexican sheep, would say that the Clydesdale, the Percheron or the thoroughbred, the stately Shorthorn, and the American Merino are an impossibility. So what we now call best may still be far behind the highest mark. There is at least much work to do to bring the average up to that of the best specimens already produced.

Good roads: These are also an evidence of progress. In common with a large portion of our country, Michigan is greatly lacking in this respect. We all know it; every one we meet can tell us of it; and all deplore it, and still do little or nothing in an efficient manner to remedy the condition. There should be no need of stating the benefits; they are too apparent to need this. Increased value to farms, lightening of labor in marketing crops, in pleasure, comfort, and beauty, they add to prosperity and happiness. Although railroads are greatly increasing, they only add to the use of highways to reach them. Economical and reliable means for the movement of your productions from, and supplies to your farm, would increase the value of the former in the market to which they are taken; and lessen the cost of the latter; on both you would be large gainers. There would be enlarged inducements to increase your productions, and increased means for the purchase of supplies. Every dollar expended for the right kind of roads will add just so much to the value of farms lying upon or contiguous to such improvements. The application of labor to the construction of enduring structures, which all may use with profit and pleasure, is desirable, and may be considered as fixing foundations on which shall securely rest many future useful enterprises.

Regarding who will be most benefited, the interests of all are so nearly alike, that they can hardly be separated, but the first great benefit must come to the farmer. Well built roads involve complete drainage of the country, largely improving its sanitary condition, reducing loss and cost from sickness; and the more the subject is analyzed, the more will appear resulting benefits, which will continue to multiply themselves.

The question comes up, how shall this be accomplished? The right thing to do is to have it done, but with our system the majority must be made to see its necessity, or the work cannot be done at public expense. Here then is work for our missionary farmer. This matter must be continually pressed home to the people, line upon line, precept upon precept. But works are best of all. Let the enterprising farmer make a section of road along his farm in good order, and keep it so; it will serve to convince. In some places public improvement associations have been organized for this purpose, and they have accomplished good work, paying the expense of course from their own resources.

Good roads are a financial, moral, and religious blessing. Nearness to market and mechanic shops is a great and constant advantage, and a hard, smooth road four miles long is practically shorter than one of two miles made of mud, ruts, and stones. To the farmer whose business requires him to go to the neighboring village twice a week, a distance of three miles, it makes quite a difference whether he drives these 600 miles per year with ease and rapidity, over a fine track, or plunges and jolts over continued obstructions. Good roads enable the country resident to take his family to lectures and places of worship, and favor the dissemination of useful knowledge in many different ways, thus becoming important agents in promoting education in the community. They are in short, one of the surest indications of a civilized and progressive people. Good roads will be a necessity in the agricultural millennium.

Improved homes are another mark of progress. First, the home surroundings, the buildings, orchards, garden, lawn, all denote the character of the owner. From a useful standpoint, the orchard and garden are profitable as well as full of pleasure. They afford material for nutritious, healthful food. The house and its surroundings must be credited as a profitable investment of capital, provided that it be constructed with reference to the health and comfort of its occupants. A farmer, above all others, needs health and strength, and very much is due to the dwelling in which he lives and spends half his time. Dr. Kedzie will tell you that the farmer's home should be the healthiest of any class of people. The necessary sanitary conditions are easily obtained. Pure air is plenty, all that is necessary is to inhale it. No need for sewer gas here. The farmer is not obliged to be a victim to his neighbor's negligence in sanitary matters.

The barns and outbuildings are also an indication of the thrift of the owner. Of course, a barn is no warmer to be painted and ornamented, but it adds to its preservation to paint it, and a reasonable ornamentation increases the beauty and value of the surroundings. At a recent dairy meeting one speaker asked the question, does a cupola on the barn make more milk? and answered, no, but it makes better milk; meaning, no doubt, that the farmer who had the enterprise and taste to build a barn worthy a cupola and put one on it, would also take better care of his stock, and consequently produce better milk.

But the home must not only be made useful and comfortable and healthy; it must be embellished and adorned within and without with taste and refinement. Farmers must realize that their highest privilege and central duty is the creation of happy homes, the best product of an enlightened culture. Every influence should be combined to foster home attachments; patriotism, itself, hinges on the domestic sentiments. When one's home, like that now hallowed ground at "Mentor," becomes the Eden of taste and interest, and joy, and love, those healthful local ties are formed which bind him first and most to the spot he has embellished, and then to his town, county, State, and country. Whatever adorns one's home and ennobles his domestic life, strengthens his love of country, and nurtures all the better elements of his nature. On the other hand, the nomad with no local attachments can have no patriotism. As content in one place as another and truly happy nowhere, he is like a tree planted in a tub, portable indeed, but at the expense of growth and strength. To Adam Paradise was home; "to the good among his descendants home is paradise," is an old saw fit to be ever new in its realization, like Goethe's saying "he is happiest, be he king or peasant, who finds his happiness at home." If our children were taught to love the beautiful, the next generation would have prettier homes than the present; and we ought to decorate our homes, and encourage the youth in caring for trees and flowers.

A noted seedsman, James Vick, now gone to his rest, deserves great praise for his generous offer continued by his successors, to send seeds free, for the planting of school grounds. This offer ought to be appreciated, as also a similar one from D. M. Ferry & Co. of Detroit.

For many years James Vick helped to make thousands of homes pleasant and attractive, and his name has become a household word throughout the land, and will be long remembered. It would be an admirable plan to have flowers in the grounds of every school-house in the country. The children would be more interested in the study of botany, a truly interesting and useful study, and they would carry tastes acquired here to the farm and home, making the homes of the future more beautiful than those in the past. There is no reason why farmers should not have the most beautiful homes of any class of people.

The home should be a constant source of experience to the child, and there is no home that can equal the home on the farm. It is a mistake we are making in educating so many of the sons and daughters off the farm—parents should see that their children acquire a love for nature. They should encourage them in the study of natural objects, plants, stones, minerals, animals, and insects. There is enough material within the reach of every boy brought up on the farm, were it used, to make a laboratory or museum fit for the study of an Agassiz. There is too much time wasted in schools over difficult arithmetical puzzles, and in learning hard geographical names of places that are of no special interest to the scholar, and probably never will be. The child is taught that to be useful is a duty; and just as many should be kept at home as possible, for enough will be drawn away without making any effort to push them.

The farmer's home of the future will be not only the best place to be born in, but a good place to live, and a good place to end one's days. Yet, I do not lament that many of our boys do leave the farm. We continually hear that the brightest, most energetic, and intelligent of the farmer's sons leave the farm for business or the professions. If this is true, it is not a compliment to the farmers. Brightness or business tact are not the only qualities needed in the farmer; it needs patience, industry, and hard common sense. Too many have the opinion that the brilliant lawyer, or the skillful physician, or the successful business man has been lost to farming, but this may not be true, and the fact of his leaving the farm may have made one less poor farmer.

The richest man in America was once a farmer, and no one ever heard that W. H. Vanderbilt was any great success in farming; but one said to be second in wealth to Vanderbilt was born and bred on the farm.

It is well-known that a large number of the most successful men and women in all pursuits and professions are from the farm. Like New England, it is a good place to emigrate from, and let us not bewail the fact that they do go. They are needed to fill the prominent positions in business, in law, medicine, and literature; they are needed for professors in our colleges and presidents of our universities; for governors and presidents; in all the great enterprises of life; and they form a link between the farming class and those in other pursuits, that cannot be broken. Their early associations always have their sympathy and support. In our own State the Agricultural college has often had its best support from those in the Legislature that belonged to the professions, and has received its most serious opposition from those who should have been its best friends.

But while we allow the boys to go from the farm and what many of them think a life of toil, we may tell them that no great position is won except by hard work, and weary, toilsome labor, not exceeded by any on the farm; that for one who gains a name and fame, thousands reach not above mediocrity, and that every good thing honestly secured comes through labor intelligently directed; teach them that the path in the cities is beset with temptations, and that there is no place like the farm in which to lead pure and happy lives. The boys and girls are the best crop on the farm, and by them must some part of success be judged. Agricultural progress will demand that the farmer of the future shall be educated. We are nearing the time of that style of farming called intensive in contradistinction to that which is extensive or extended. We must go deeper instead of wider, producing the greatest crop on the fewest acres. We are nearing the time when our agriculture must be conducted on scientific principles. The farmer must be a student of the soil, he must know its wants and capabilities, and must have good judgment as well as study. The scientist may seek original investigation, but the farmer must be sufficiently educated to practically apply the knowledge gained. One stock of fertilizer which must increase is brains.

The Agricultural College must be an important factor in the progress of the future. Of recent growth, such colleges are an acknowledged and increasing power in enlarging the sphere and extending the resources of the farmer. They tend to ennoble agriculture because they ennoble the agriculturist. I am happy that Michigan has one of the best, and I trust it will not lack appreciation and support. The demand for experimental stations is another sign of agricultural progress. The demand for investigation by scientific methods is increasing. Intelligent farming resents the method of accepting theories only, but demands the reason for the cause that produces an effect. The future farmer will be full of information. If he does not acquaint himself with what is new in his business, he may as well give up; he may be sure that those who do keep up will excel him. The day has gone by when the ignorant can be a successful farmer. Within a few years past agriculture has undergone great changes, and the leading agriculturists are fast becoming the leading men of the country. It may be admitted that there was more of solid comfort in the good old days, than there is to-day throughout the farming community; and there ought to be. Farmers dress better, live in better homes than their fathers did. Their wants are of a higher class, proving that they are rising above the social plane on which their ancestors were contented to remain, instead of sinking to the peasant level. They set out upon the race of life at a swifter gait, and in order to hold the pace they must use brain as well as muscle, and brain work is wearing work. The former days were full of solid comfort, but the farmer of the future who is content with a drowsy existence will inevitably be left, for his children will demand and receive what other children have, and if the farm is managed on the slovenly method, or allowed to run itself, it will not supply the necessaries of life. In every community there can be found farmers who do more than subsist on the products of their acres. They prosper in business because they conduct their farms on business principles. With the necessity of getting a more productive increase from the soil comes the necessity of more study and more knowledge. The time has come when the close calculating of the manufacturer must be applied to agricultural practice. It has recently been truly said, that "the farm must be treated as a *factory*, not as a *mine*."

In the factory, profits are made by saving the small percentages of waste, by adopting labor-saving contrivances, by watching the markets, by making as much finished product and of as good quality as possible with a given amount of raw material, procured at the least outlay. If he manufactures butter he must run his cows—which are his machinery—with the same watchful and intelligent care which is exercised by his neighbor who conducts a sugar refinery or a cotton mill. He must see that his cows have a perfectly balanced ration, with the properly proportioned amounts of protein, starch, and fat. He must get his rations at the cheapest possible rate, and, following the example of other manufacturers who sell a finished product and buy a waste product, he will sell his grain and buy cottonseed meal, brewers' grains, bran, and other wastes of manufacture to make his finished butter product.

He will not strive to make more butter than his neighbor unless he can prove that the extra pound can be profitably made. He will make special study of the subjects immediately connected with the particular branch of agriculture which he practices, and he will supplement his own experience by the teachings of recognized authorities, and he will make use of every assistance which can be rendered by such accurate experiments as can be conducted and recorded at the best agricultural experiment stations yet to be established In other words, he will not be content to remain a mere laborer, but will assume his true position as the administrative head of a complicated but intelligently constructed and well ordered system.

Farming of this kind will pay to-day and in the future. It will pay not only in the narrow and pecuniary sense, but it will grow a crop of better men. The coming farmer who survives the fierce struggle of close competition will develop out of the necessities of his surroundings into a broader minded man than his predecessor.

A good deal of pleasant flattery is indulged in by politicians and public speakers when addressing farmers, on the ennobling influence of agriculture. Agriculture will be what her followers make her. No employment is ennobling which does not require brains, and it is not a misfortune that from this time forth the farmer who succeeds must study and think, and have a trained mind in a sound body.

But all success in agriculture does not consist in accumulation of material interests. A recent writer has given so clearly the idea of success from another standpoint, which I quote: "I have in my mind's eye a number of men (I use the term in a connubial sense, for if there ever was a pursuit in which the wife is truly the better half, it is in farming) who started in agricultural pursuits with only a few hundred or a thousand or two dollars saved, it may be from their wages or the fruit of a small inheritance. In many cases it was barely enough to stock a farm and pay the usual one-third purchase money. But under the double spur of love of ownership and the necessity of meeting their engagements they bent every energy to free themselves from debt and make their homesteads entirely their own. Brought up in the habit of strict economy, their children shared in the hardships of adversity, as they afterward shared in the brightening prospects of prosperity. In this stern but hopeful struggle with the force of circumstances, the parents developed in mind and character, and filled their place among the most honored and useful members of society; while the children, thanks to their early training, to free schools, and an educating press, became fitted for that higher struggle which increasing civilization demands. Who shall say that these men and women, although they may have amassed only a few thousand dollars, have not in the highest sense of the term, made farming pay, and life a success.

"And still more than for the individuals, for our country have their lives been a grand success. The verse of the English poet is unfortunately too trite to quote, but true it is that intelligent, independent farming communities should be the pride as they are the power and safety of the country. And especially will a large class, such as I have described, who, by their birth, their lives, and their fortunes are identified with both the labor and the capital of the country, do much to counteract the baleful effects of vast wealth and political power upon republican institutions."

Such suggestive paragraphs as these open a wide field for reflection on the conditions and influence of success worth striving for, and which is not to be measured by real estate standards or market estimates. "Man shall not live by bread alone."

I am one of those who believe that agriculture will reach its highest condition in this fair land of ours, in these United States. The great assistance we are receiving from our scientific workers; the help we must receive from our agricultural schools; the recognition we are sure to receive from the government if we demand it; the genius of our free institutions which gives every one who will the opportunity to own a farm; our comparative freedom from rents and taxes; all tend to put our farmers, with their enterprise and intelligence, in a far better condition for advancement than are those of the old world. Unhappy tax and rent-ridden Ireland, whose people have been driven to desperation by her wrongs; but little less unhappy England, whose farmers rent nearly all the land they cultivate; the severally taxed people of continental Europe, whose toilers have so many useless and expensive scions of nobility to support, together with an immense army of non-producers, are not promising places for the advent of the millennium of agriculture, which I expect will come. We must look with alarm at all tendencies to create great landed estates. Every one who has the means has also the right to invest in land, and it is undoubtedly a safe business venture, but small farms are best for the State—a statement few will deny. They allow better opportunities for schools, churches, and social privileges. Fortunately large farms are not proportionately as profitable as smaller ones, and never will be. Large cultivated farms have always failed in this respect, and it is hoped they always will. There are good reasons for this, because in farming all the details, of which there are many, must be under the eye and judgment of the owner to secure success.

In the millennium of agricultural industry, every farmer must cultivate the land he owns, and own the land he cultivates, and literally "sit under his own vine and fig tree."

While I plead for continued advancement, for greater progress, I cannot forget the pioneer agriculturists of Macomb county. You all know them and of them. How much of toil and privation they endured and suffered, you have heard from them or suffered and endured with them. Macomb is altogether an agricultural county, and owes what she is to the energy and enterprise of her farmers. They have done their work well. It took brave hearts and strong hands to come to the wilds of Michigan half a century ago, and hew from the forest a home and farm. They were men and women of strong minds and determined wills. No generation to succeed them with all their opportunities and all their facilities, will do better than they; never in the material progress of the county will there be a period when she will advance faster than in their day.

History may not record all their names, but their deeds remain engraved on the face of nature, ever reminding us of energy, industry, and virtue; with a nobleness of character which we do well to imitate. These men lived lives of toil unknown to the present generation. They cleared the heavy timber from the land, root, and branch; they have cultivated and drained the soil, planted orchards of choice fruit, builded comfortable dwellings and fine barns, bought and bred choice stock, among the earliest and of the best in the State; they have so carefully nourished the soil that Macomb county stands to-day among the first in average yield of crops. They established schools and founded churches, and in their toilsome but happy homes, reared to noble manhood and womanhood, sons and daughters. Had I ability equal to my zeal, I would write their names imperishable. Many of them have gone from us; some still remain, with whitened locks and three score and ten years behind them. We cherish the memory of those who are gone; we honor and revere those who remain (may they yet find an historian to do them justice).

Young men and women of Macomb, they leave to you noble monuments of their labor, in these fine farms and pleasant homes, and nobler monuments in their lives of independence, of industry, and virtue. I charge you to cherish their memories, follow their examples, and teach them to your children to the third generation, so that in the coming days when agriculture shall sit the noblest industry of the nation, Macomb county will be foremost in crops and stock, in fruits and flowers, in fertile farms and pleasant homes, and more than all in noble, cultured men and women.

THE EARLIER HISTORY OF THE MICHIGAN STATE AGRICULTURAL COLLEGE UP TO ITS RE-ORGANIZATION IN 1861.

BY PRESIDENT ABBOT.

[Read at Hastings Institute.]

The ordinance of 1787 for the government of the Northwestern Territory ordains, "That religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged." Michigan, a state formed out of this territory, has lived faithfully up to the spirit of this famous ordinance. Her liberality to her institutions of learning, and their success, have given her a wide and honorable fame throughout the Nation, and to no inconsiderable degree throughout the world.

The crowning glory of her educational system is the University. But something approaching her fame has come also to her Agricultural college. A military chieftain of a gulf state, elected president of the Agricultural college of that state, has exhibited to our board of agriculture a written order from his own board, to visit our Agricultural college, and take a graduate, if possible, as a professor in his own, and he took two, one of whom is still doing them excellent appreciated service, and the death of the other was chronicled in their state as of the nature of a state calamity. Maine and Oregon, Texas and Minnesota have or have had her graduates as professors, and thirty of her short roll of graduates have been called to permanent places of trust in the colleges of the land. The college has, at this time, graduates as officers in the Agricultural colleges of New York (Cornell), Indiana, Mississippi, Texas, Missouri, Michigan, Kansas, Wisconsin, Iowa, Colorado, and Oregon. The experiments and addresses of her officers have been published and approved in France and England.

I propose now to give the earlier history of the college, more especially up to its reörganization under a State Board of Agriculture in 1861. Subsequently to this reörganization there have been published an annual catalogue and regular reports; but up to the year 1861 there were no catalogues of students except that issued just after the first opening of the institution, and imperfect lists for some of the terms. The reports, too, for these earlier years are very imperfect. But I became an officer of the college at the beginning of its second year, and in the first year I visited the college. The officers, when I first visited it, lived in the city of Lansing, all except two unmarried men, and went to and from their work over hills and through valleys, over a decayed plank road and through a swamp sometimes covered with water. Arrived at the college, the buildings—a college hall, a boarding house, a brick barn, all there were—were in a clearing in the forest, where stumps of trees came up to doors of the buildings. The first President was then there; so was Mr. J. C. Holmes, to whom, more than to any other, the college owes its existence. An acquaintance, therefore, with the founders and first officers and students of the college has enabled me to present, with some fullness, the records of those earlier times. Many of the men who had to do with its organization and early management are still living and still the true friends of the college. Not a few of its very earliest students are still known to me, and more would have been, but that alas! the civil war seems to have drawn very largely from the early students of the college. All of the first graduating class of seven (1861), except the two victims of the war, are still living. Fourteen of its students on its opening day are still personally known to me, and one* of them was a Senator in the last (1883) Legislature. I have in some cases gathered reminiscences from these persons, who are by nearly a year older in the college than myself.

It is now (July, 1883) somewhat more than a quarter of a century since the Michigan State Agricultural College was opened to students, the twenty-fifth scholastic year having ended with the commencement exercises of August 13, 1882. The college is the oldest of the existing agricultural colleges of the country; was, therefore, the pioneer institution of the kind. It has had a steady development in a continuous life without the loss of a term from first to last.

Nearly all the Agricultural Colleges of the country, of which there is now one to nearly every State, owe their origin to the Congressional grant of lands for this purpose, made in 1862. Pennsylvania and Iowa, as well as our own State, established their colleges before this grant of lands. As the first institution of the sort our college has been visited by officers or committees from many other States, and has had considerable influence in the organization of other institutions. The Presidents, and in several instances other officers also of similar institutions in Maine, Massachusetts (three of them), New York (President White and Mr. Ezra Cornell), Mississippi, Missouri, Tennessee, Ohio, Indiana, Wisconsin, Iowa, Ontario, Kansas, Colorado have visited us, and officers or committees from Virginia, Arkansas, Minnesota, Texas, Oregon, California have visited us or have taken graduates for officers. The several States have, of course, organized their college after their own plan; but a curiosity naturally attached to the college that began the untried system of agricultural education upon a farm, and in some respects more especially in the working of compulsory manual labor, we have been acknowledged to be more successful than most other colleges, although the wisdom of requiring manual labor is by no means generally conceded.

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* Hon. C. J. Monroe.

It is a peculiarity of the educational history of Michigan that from the first its laws recognize the dependence of agriculture upon science, and the consequent claims of the art to a place in any full educational scheme. It is not indeed, directly recognized in that oldest law, the quaint law of 1817, when the governor and judges, in whom the administration of the Territory resided, ordained the establishment of a catholepistemiad or university of Michigania. Yet this was to have a didaxia of catholepistemia, or universal science. But when the University of Michigan was established in 1837, and branches provided for in different parts of the State, not more than one to each county, it was distinctly provided that "in each branch of the University there shall be a *department of agriculture*, with competent instructors in the theory of agriculture, including vegetable physiology and agricultural chemistry, and experimental and practical farming and agriculture."

The first Superintendent of Public Instruction, the Rev. John D. Pierce, appointed in 1836, to whose zeal and wisdom in the cause of education the State owes so much, speaks in 1839 of establishing a department of agriculture in *one* of the branches, as an object of great interest, and such establishment in *one* branch was subsequently urged as required. The law may have been amended to read one, instead of every branch.

So, when the State Normal School was established in 1849 (dedicated Oct. 5, 1852), its object besides that of educating teachers is, in the language of the law itself, "to give instruction in the mechanic arts, and in the *art of husbandry and agricultural chemistry*."

It was not very strange, therefore, although a very unusual thing, that agricultural education should find, as it did in 1850, a recognition even in the constitution of the State.

STATE AGRICULTURAL SOCIETY.

Meanwhile a new influence in favor of agricultural education, which finally took the form of a demand for a separate school of agriculture, for an Agricultural College came into being. This was the State Agricultural Society.

In March, 1849, some sixty members of the Legislature, then in session, issued a call for a meeting to organize a State Agricultural Society. The Society, still in vigorous life, and a friend of the Agricultural College, was incorporated by an act approved April 2d of the same year. John C. Holmes was its first Secretary, an office which he held for several years. The Society at once instituted annual fairs, and following good New England and New York customs, spared time from exhibitions to listen to an annual address. The address for the first fair (1849) was, strange to say for those days, a farmer, the Hon. E. H. Lothrop, of Galesburg, a brother of the well known G. V. N. Lothrop, of Detroit, and in his address so foreshadows the character of our Agricultural College, that I am tempted to quote a few paragraphs.

His language is: "I well remember when the question of the location of our State University was pending before the Legislature, a proposition was made that at least eighty acres of land should be secured at or near the place of its location, and the reasons given were that the State might eventually wish to establish a department of agriculture in the same, and for that purpose would require that or a greater quantity of land, for the erection of an experimental farm. The proposition was received with evident surprise, and found no favor. Why our people and our law-givers were so blind to our best and true interest, I can give no rational explanation, unless it be our deep veneration for the past, or, at that time, there was no institution for teaching the art and science of agriculture in any of the States of this Union.

"While our people and our government, both State and national, are truly liberal and pour out their money like water in the establishment of literary and other public institutions, and dot our land over with theological seminaries, with law seminaries, with medical seminaries, and with military seminaries, poor agriculture, whose hand sows the seed and whose arm gathers the harvest on which all our earthly comforts, and even our very existence depend, as yet has no seminary in which to teach her sons the most valuable of all arts."

"I cannot consent to leave this branch of my subject without fortifying the same with one or two authorities. Says an eloquent writer, "Where is the man of so much apathy, as not to be cheered with the anticipation of beholding such an institution, an extensive and handsome edifice, where our young men shall be taught in theory and practice those immutable principles of nature, which form the only infallible guide to all the substantial comforts of life; when, by mingling the useful with the sweet, they will become inured to the habits of industry; when science and art shall combine to inspire them with a laudable effort to excel each other? If we are charmed with viewing a garden on a small scale, the work, perhaps, of a single but skillful individual, how infinitely more charming must be the view of three or four hundred acres, planned and laid out with all the accumulated skill of ages, aided by all the light which science has thrown upon the subject, with all the beauties of the vegetable world, and all that is useful in the animal? Can any earthly prospect be more beautiful? I answer yes; that of two or three hundred young men vying with each other in skill and industry, not only in improving and beautifying the establishment, but by improving their minds by study and their bodies by manly labor, infinitely more pleasing and to their credit than the mountebank feats of a gymnasium, thus fitting themselves as brilliant lights to guide, instruct, and adorn the succeeding generation."

From the time of its organization the Michigan State Agricultural Society took the lead in the demand for an agricultural school. Some of its members, no doubt, were educated men from the East. Journals of agriculture were very few, but Sir Humphrey Davy, who began lecturing in England in 1801, and Boussingault, in France, who began writing in 1844, and others, had caused a new era to dawn upon agriculture. These men were aware of this, and were anxious that agriculture should participate in the enormous advantages that science was conferring upon mechanics and the simpler arts. There were others, now well-to-do farmers, and men of influence, who had hewn their farms out of the forests, and desired that their children should possess the education which they lacked. They remembered the time when the men of chief influence in Massachusetts and New York were farmers, and felt that in the hurry of later times, in an age of machinery, of division of labor, and the growth of cities, the farmers, as a class, were losing influence, and they believed in education as the equalizer of the classes of society. The influence of both these kinds of ideas and sentiments is plainly seen in the discussions of those times, and in the early workings of the college.

From this State Agricultural Society, and its indefatigable secretary, Mr. Holmes, came the memorials to the Legislature, the personal examination of the plans of making use for agricultural education, of the Normal School and

University, the advocacy of an independent college upon a farm, the selection, under restrictions, of the site, and subsequently, in 1861, the advocacy of a separate board—the State Board of Agriculture—for the control of the college. Just before the opening of the college to students, the society gave to the institution its library. Two, at least, of the members of the State Board of Agriculture—Messrs. Welch and Phillips—were nominated to the governor by the society.

The relations existing between the State Agricultural Society and the college are most cordial. The society has a standing committee upon the college; and of late years its executive committee and officers have been wont to spend a day each June at the college. These June days are festive days, when, as guests of the State Board of Agriculture and of the faculty, the Agricultural Society, with the officers of the equally friendly State Grange, and State Horticultural Society, the affairs of the college are looked into and talked over in an open conference, in the general lecture room of the institution.

1850.

January: A memorial was presented relative to agriculture by Bela Hubbard, Titus Dort, and J. O. Holmes, representing that the committee of the State Agricultural society had had in consideration a subject of great importance, viz.: The establishment of a central agricultural office and an appropriation was deemed desirable for a library. Of this subject, in connection with university, the agricultural committee says: In the organization of our State university it was contemplated (as appears by section twenty-six of the act) that "in one of the branches there should be a department of agriculture, including vegetable physiology, agricultural chemistry, and experimental and practical farming and agriculture."

"Such a department, it is plain, to be vigorously and practically carried out must have its more immediate and vital connection with the State Agricultural society and its institutions. With an agricultural college should also be associated a model and experimental farm, a botanical garden, and perhaps a veterinary establishment.

"By these means will the farmers of our State—its great leading class—be furnished with institutions peculiarly theirs. They will be provided with the means of educating their youth in every practical and scientific detail necessary or useful to that most important of all occupations, to as full an extent as is now afforded by the higher colleges of our land, to candidates for the so-called "learned professions."

Another memorial from the State Agricultural society was presented to the Legislature, praying for the establishment of a State Agricultural college. As to the character and scope of such an institution the memorial says:

"The first and most important consideration is, that the institution would be a labor school, in which the actual work performed by the pupils would be passed to their credit, in the account for their instruction. Thus the expense would be greatly diminished if not altogether paid. The very act of labor would be a practical application of the precepts taught, and the poor would enjoy equal privileges with the rich.

"The institution should be attached to or form a branch of the State University, contemplated by the charter of that institution, and having the benefit of lectures from professors, and such other sources as may be expedient; resident professors, with expensive salaries, would not be necessary.

"The studies taught at this college should be of an eminently practical kind. Besides agriculture in its details, mathematics and the keeping of accounts, mechanics, natural philosophy, and the natural sciences, with their applications to agriculture. With these could be profitably associated anatomy, so far as connected with the structure and diseases of animals, and the study of insects and their habits, and to some extent engineering, architecture, and landscape gardening. Nor should the claims of literature and the fine arts be wholly neglected as tending to polish the mind and manners, refine the taste, and add greater lustre and dignity to life. In fine, not only a useful, but a learned and liberal profession; and its cultivators not the 'bone and sinew' merely, but the ornaments of society.

"One prominent advantage possessed by the pupil in such an institution should not be overlooked, in the judicious combination of labor and study, resulting in confirmed health, and thence increased mental as well as bodily vigor. But the importance of the plan proposed will weigh little unless it shall prove to be *practicable.* The only obstacle that can be reasonably supposed to exist is the expense of founding and conducting such an establishment. In the communities of the Old World this obstacle, serious as it is under their circumstances, has been overcome, and with triumphant results. Probably no community in the world possesses greater facilities for the experiment, if it be deemed such, than ours. On the plan suggested no large endowment is necessary. The connection with the University would furnish a large part of the means for instruction at comparatively little cost to the institution. Nowhere in a settled community is land so cheap at the present moment as in this State. No State is more amply provided with landed and other means for the promotion of education. May not a part of this fund be as legitimately applied to this object as to other plans of educational improvement?

"There should belong to the institution a *farm* of sufficient capacity to embrace a variety of soil and surface, upon which all the operations of agriculture connected with tillage, the culture of all the useful grains, grapes, and roots, the raising of stock, etc., could be conducted to the best advantage, and where the operations of draining and the treatment of different soils could be thoroughly exhibited; in fact, a farm which, under the superintendence of practical and scientific masters, should become a *model* for the farms of our State. There should also be attached a botanical garden, to be under the charge of the Professor of Botany of the University, in which should be cultivated specimens of the trees, shrubs, and plants indigenous to our State, as well as all plants and weeds, a knowledge of the properties and habits of which is useful to the farmer."

Further action of the Executive Committee of the State Agricultural Society will appear subsequently.

STATE CONSTITUTION OF 1850.

In 1850 a convention was held to form a new constitution for the State. The constitution framed by this convention was adopted. The members of the convention could but feel the influence of the debate, and prevailing sentiment regarding agricultural education. The debates on the subject are briefly epitomized in the report of the Superintendent of Public Instruction for 1852, pages 242, 246 to 253, 258. Section 9 of the constitution provided for an Agricultural school, as follows:

CONSTITUTIONAL PROVISIONS.

The Agricultural College of the State of Michigan was established in obedience to a requisition of the Revised Constitution of the State, adopted 15th August, 1850, which requisition may be found in Art. 13:

"SEC. 11. The Legislature shall encourage the promotion of intellectual, scientific, and agricultural improvement, and shall, as soon as practicable, provide for the establishment of an Agricultural school. The Legislature may appropriate the twenty-two sections of Salt Spring lands now unappropriated, or the money arising from the sale of the same, where such lands have been already sold, and any land which may hereafter be granted or appropriated for such purpose, for the support and maintenance of such school, and may make the same a branch of the University for instruction in agriculture and the natural sciences connected therewith, and place the same under the supervision of the Regents of the University."

1851.

In 1851 Gov. Barry called attention in his message, to the constitutional provision, and considerable discussion was provoked on the subject. The Superintendent of Public Instruction, F. W. Sherman, and the Hon. John Shearer, chairman of the House committee on agriculture, recommended the forming of a department for instruction in agriculture in the Normal School. House Doc. No. 5, 1851, and letters on file.

The University at once proceeded to organize an agricultural school as a department, and Dr. Henry P. Tappan, Chancellor of the University, wrote to Secretary Holmes (letter on file), that anticipating that the twenty-two sections of salt spring lands, named in the constitution, will be given to the University for an agricultural school, "We have accordingly organized an *agricultural school* as part of the scientific course recently adopted by the faculty and regents." The agricultural course extended through four terms, three terms constituting a year.

Dr. Tappan afterwards gave an address at the State fair (Sept. 1853), in which he speaks of his plan still further. See Michigan Agricultural Report, 1853, pages 188, 198 to 200.

In 1854 the chair of agriculture in the University was filled by the Rev. Charles Fox, an Englishman, educated at Rugby, Rector of the Episcopal church at Grosse Isle. Agriculture was the favorite study of Mr. Fox, and he had some time previously to his appointment given to the University library $100 to enlarge the store of agricultural literature. Mr. Fox died after occupying the University chair less than two years. Our library contains a work of Mr. Fox's on agriculture.

1853.

A bill for an Agricultural College passed the Senate of 1853, by a vote of 17 to 14, but was lost in the House by a vote of 36 to 24. The Society then sent its executive committee to visit the University and the Normal School to see what was doing in the way of instruction in scientific agriculture in those institutions. They visited Ann Arbor January 25, 1854. Professor Fox was delivering at the time a course of lectures on practical and scientific agriculture. The committee listened to a lecture by Professor Fox on "Rotation of Crops," and were highly pleased. The committee also listened, at the Normal School, to a lecture by Prof. L. R. Fisk, on "Organic and Inorganic Materials of the Soil, and its Improvement by Manuring, Draining, and Pulverization."

The State Agricultural Society, however, had become fixed in their preference for a separate institution, and in December, 1852, appointed a committee to urge on the Legislature the establishment of a separate school, not in immediate proximity to any existing educational institution, on a farm of not less than 640 acres. Michigan Agriculture, 1854, pp. 340 341.

The society appointed another committee, Mr. S. M. Bartlett, of Monroe, to draft a bill, to present to the Legislature of 1855. The bill was put into shape by the Hon. Isaac P. Christiancy, a townsman of Mr. Bartlett's, and subsequently Chief Justice, and U. S. Senator, and was substantially the same as afterwards became a law.

1855.

In his message to the Legislature January 4, 1855, Governor Kinsley S. Bingham recommended the establishment of an Agricultural school, in the following language:

"The Constitution also declares that the Legislature shall, as soon as practicable, provide for the establishment of an Agricultural school. I respectfully submit for your consideration, whether that practicable period has not already arrived. Michigan is eminently an agricultural State, and the great source of our dependence and wealth must ever be in the soil. It has been demonstrated that its productions can be greatly increased by scientific cultivation. Our citizens may indulge a just pride for their efforts in establishing schools for intellectual and scientific improvement, but this most important branch of education has been almost entirely neglected. It seems, therefore, highly proper that provision should be made for instruction in everything that pertains to the art of husbandry, and practical and scientific agriculture. Our efforts in this direction should never cease until our young men, engaged in the useful and honorable occupation of farming, shall have received the same high education as those designed for other professions."

A bill for the establishment of the college was introduced into the House and into the Senate. When the House bill came to its third reading, various amendments as to location were made and rejected, and the bill was rejected 31 to 39 (Feb. 7). The Senate bill, however, fixing upon the vicinity of Lansing as the location of the college, passed (Feb. 9) the Senate by a vote of 24 to 5, and the next day passed the House by the large vote of 52 to 13. This bill is known as Act No. 130, approved Feb. 12, 1855.

Governor Bingham was a warm friend of the measure, and of the college. He took a prominent part in the exercises at the opening of the college (June 16, 1857), and a few months before his death, Oct., 1861, he sent to the college library as a token of his good will, a set of the works of John Adams, in ten volumes.

But to no one man is the college so much indebted as to Mr. John Clough Holmes, the first secretary of the State Agricultural Society. Into the project of establishment of a school of agriculture and horticulture he entered with singular zeal and devotion. He collected information from all quarters, and there were no features of the organic law which he had not discussed with those who were best qualified to give advice, and none of them that do not show his shaping hand. He was frequently at Lansing, conferring with State officers and Legislators on the subject, and spent nearly the whole legislative winter of 1855 in Lansing, in diffusing a knowledge of the plan and awakening an interest in it, and this was done at his own private expense. Mr. Holmes gave the college his personal assistance as professor of horticulture during the years 1857, 1859, and 1861. Mr. Holmes is still, 1883, a not infrequent and always welcome visitor at the college, and one of its warmest friends.

LOCATION.

A late directory of Lansing says: "When, in 1847, it became necessary for the Legislature permanently to locate the capitol of the State, so many places were found competing for the honor that it was absolutely impossible to secure an agreement for any. After a long and bitter contest, the present site of Lansing was fixed upon as a sort of truce measure, the idea no doubt being that when the excitement had quieted down somewhat, it would be easy to secure the transfer to some more eligible point. But that time has never come." But the citizens of Lansing never felt secure of the capitol until the construction of the edifice was entered upon in 1871.

Under a like spirit of compromise the Agricultural College was located near Lansing. The House bill for the establishment of the college was lost in 1855, as has been mentioned, after the proposal of many locations had been made while on its final passage. The law, as enacted, committed the selection of the site to the Executive Committee of the State Agricultural Society, with these conditions: To be within ten miles of Lansing; not to cost over fifteen dollars an acre, and to consist of not less than five hundred, nor more than a thousand acres in one body. Such a location was not at all to the taste of the friends of the college. They thought such an enterprise should have been started on an improved form, in an easily accessible part of the State. But here was a wilderness for a farm, near a place to be reached only by staging over bad roads for more than twenty miles.

It was not until 1869 that the location of the college was to be considered settled. The president and some other officers of the university strongly advocated making the college a department of the university, and locating it at Ann Arbor. The Detroit press, and most of the newspapers of the southern part of the State freely expressed the same views.

In this contest the farmers of the State, however much they might begrudge appropriations in war times, or prophesy that graduates would not go to farming, always objected to the uniting the Agricultural College to any other institution.

In 1865 (February 24) the executive committee of the State Agricultural Society petitioned the Legislature to remove the college to some more eligible locality. It was met by a counter memorial of Hon. H. G. Wells, of Kalamazoo, remonstrating against the removal. (1865, House Doc. No. 11.)

In 1859, a bill, turning the college over to the University, was offered as a substitute for an appropriation bill.

In 1867, the subject of removal was advocated in the Detroit and in other papers freely. The discussion of the location of the college did not cease until 1869. In that year a carefully prepared bill for the transfer of the college to Ann Arbor, as a department of the University, was introduced into the Senate, and came up for action when the House bill appropriating $70,000 came up for concurrence from the House. On some side issue the bill for the transfer was defeated, and the appropriation bill passed in the Senate by the decisive vote of 22 to 8.

An editorial in the State Republican, March 18, a Lansing paper, edited by Stephen D. Bingham, under the heading of "End of a Ten Years' Fight," spoke of the vote as ending forever a fight to destroy an institution, which a democratic majority have provided for in the constitution, and a republican majority have put into active operation.

Mr. Bingham adds: "To the warm friendship of Governors Bingham, Wisner, Blair, Crapo, and Baldwin much is due in the past and present; to Hon. Hezekiah G. Wells, of Kalamazoo, who has stood by it in all these years of battle, and with his pen, and by his influence, exerted in its behalf at all times, and most effectively in the present decisive struggle, all honor; to Hon. J. Webster Childs, of Washtenaw, and the members of the State Agricultural Board, thanks for their effective vindication of its merits, and unflinching friendship in its behalf; to Hon. Benjamin L. Baxter, of Lenawee, a member of the House, and to Hon. George Willard, of Battle Creek, editor of the Battle Creek Journal, both regents of the University, who have, by all honorable means, advocated the claims of this institution to the support of the State, grateful recognition is due; to the citizens of Washtenaw, Oakland, Livingston, Calhoun, Eaton, Bay, Jackson, and other counties who have sent in petitions on short notice in favor of the college and its present location, the just meed of praise for carrying out honest conviction for justice and right."

March 31, 1869, the Detroit Post, which had advocated removal, in an editorial written by Mr. Conover, one of its editors, and more recently rector of St. Luke's church, Kalamazoo, after speaking of its advocacy of a removal to Ann Arbor, says: "But the action of the State government has been so sweeping and provident that the Agricultural college may be looked upon as a permanent institution, unless it contains some inherent defect that no money nor State aid can supply. We by no means undertake to say this, and we hope the citizens of the State will so avail themselves of its privileges as to put its success beyond peradventure. Since the State has determined to pay for them, they ought not to be neglected. It would be folly not to seek as large a return as possible from the investment, and we have no hesitation in urging a cordial support of the college, and to invite a renewed interest in it, and in its capabilities for educating and developing a strong, earnest, intelligent farming community."

The Free Press and most of the other papers of the State became at once the supporters of the college, and the institution has no reason to find fault with the attitude of the press of the State towards it, but has on the other hand reason to be grateful for frequent favors.

It was quite time the question of location was settled. Biennially the college would open in February, and for weeks after it was a question whether the college would live or die. Students would become impatient of the disheartening suspense, and sometimes pack their trunks and go away. The discussion of location has taken this historical sketch years on beyond where a chronological order would have taken us. But it finishes one of the mooted questions of the college for its first ten years.

It is proper to say, also, that courtesies and good will have constantly been extended to the college by the University of Michigan. The present eminent President, in particular, Dr. James B. Angell, has more than once addressed its officers and students, and has always manifested a sincere gratification in its prosperity.

THE SITE.

The Executive Committee of the State Agricultural Society selected for the college its present site, three and a half miles directly east of the State capitol. Michigan avenue runs from the capitol straight to the college entrance. The grounds, including a park of a hundred acres, consist of six hundred and seventy-six and a half acres of land lying on both sides of a small stream called Red Cedar River was approved for the selection of the site.

June 12, 1855—The Executive Committee of the State Agricultural Society met in Detroit June 12, 1855. Those present were A. Y. Moore, President; J. C. Holmes, Secretary; Messrs. S. M. Bartlett, Payne K. Leach, James Bagley, Justus Gage, and John Starkweather. Hon. J. C. Holmes, the Secretary, delivered an address regarding their duties, etc., including, in full, a paper of Prof. Winchell of the University, advocating the union of the school with the University; including, also, large parts of President Hitchcock's report to the Massachusetts Legislature on European schools of agriculture. Mich. Agr. 1854, pages 337 to 404.

June 16—On June 16, 1855, this committee reported the present site of the school (Mich. Agr. 1854, p. 404), and their selection was approved by the State Board of Education.

Mr. Holmes was appointed to submit a plan for buildings. January 2, 1856, he presented a plan for a west wing of a college building. It is the present college hall. A main hall and an east wing were to complete the group, forming a court. Prof. Fisk was consulted regarding the arrangements of the chemical laboratory. The chapel was then where it is now, except that the desk was on the north side, and was simply the lecture table of the class room in chemistry; the chemical laboratory occupied the north half of the first floor. The library occupied the northeast and the museum the northwest corner rooms of the upper floor. Mr. Holmes reported the plans also for the dining hall and dormitory, a building since consumed by fire.

The report was adopted. Mr. S. M. Bartlett, of Monroe, was appointed superintendent of the buildings.

January 21, 1857, the Board of Education made a communication to the Legislature in which they announced that the west wing and the boarding hall were nearly completed, and that they had expended about $10,500 for the farm and $34,774.19 for buildings and improvements. A brick barn had been erected. The building is now used as a carpenter's shop.

ORGANIC LAW OF 1855.

This law continued in force until March 15, 1861. Besides providing for the selection of a site, the act proceeded to place the college to be established under the direction and control of the State Board of Education, an elective board of three members, having charge of the State Normal School and having the Superintendent of Public Instruction for its secretary ex officio. The course of instruction was to include "an English and scientific course, natural philosophy, chemistry, botany, animal and vegetable physiology, geology, mineralogy, meteorology, entomology, veterinary art, mensuration, leveling, and political economy, with book-keeping and the mechanic arts which are directly connected with agriculture, and such other studies as the Board of Education may from time to time see fit to prescribe, having reference to the objects specified in the previous section."

There were to be two terms of study a year, the first term from the first Wednesday of April to the last Wednesday in October; the second term from the first Wednesday in December to the last Wednesday in February. Students were to labor daily, and during the first term of each year, not less than three, nor more than four hours a day, and none were to be "exempt from such labor except in case of sickness or other infirmity."

The secretary was to keep a full record of improvements and experiments, and of the crops of each field. Tuition was to be free to citizens of the State.

INAUGURATION.

On the 16th of June, 1857, the Governor and several officers of the State government, the officers elect of the institution, and a large concourse of citizens from various parts of the State, and some sixty-one students (increased to ninty-seven before the close of the term) ready to form the first class being gathered, the college was formally dedicated by the Board of Education to the purposes for which it was designed.

The Hon. H. L. Miller, president of the Board, first made a few remarks. He closed with saying, "I deem it peculiarly appropriate to recognize the guardianship of that one Great Being, who is before all human powers." Rev. George Willard, member of the Board, then read the third chapter of Proverbs; prayer was offered, and the Hon. John R. Kellogg, the senior member of the Board, then delivered, in an appropriate speech, the institution and farm into the charge of the president and faculty, who had been previously chosen.

The Hon. Joseph R. Williams, of Constantine, president of the college, then delivered his inaugural address, a discourse wise, forcible, and elegant. He spoke of the lack of institutions which, taking students directly from the common schools, and omitting studies purely literary and classical, carried them farther than the university in the application of modern science to the practical business of life, especially agricultural life. He says:

"That the agricultural masses have felt keenly this great want is evidenced by the simultaneous creation of agricultural societies and periodicals, and the craving for more abundant knowledge. Colleges are springing from the same necessity. New York and Pennsylvania are maturing, and two or three other States are taking the initiatory steps towards establishing Agricultural colleges. Here, on the very margin of the cultivated portions of our country, where the 'forests primeval' are just vanishing before the encroachments of civilization, the youthful and vigorous State of Michigan, first among her sister States, dedicates this institution to the instruction of men who are devoted exclusively to the cultivation of the earth. Established on no precedent, it is alike a pioneer in the march of men and march of mind. It is peculiarly fit that such an enterprise should be founded on the confines of the country, which a native poet, Whittier, so gushingly describes:

"'The rudiments of empire here,
Are plastic yet and warm,
The chaos of a mighty world
Is rounding into form.'

"The elements of the institution around us are rough and crude, but even in the embryo, we recognize an enlightened forecast that would do honor to those venerable commonwealth which have stamped their indelible impress on the history of mankind."

Mr. Williams spoke of the objections that would be raised to the institution. They would call it an experiment, and demand results, before they were willing to afford aid or sympathy. They would object to its cost and would leave it unendowed, and subject to the caprice of successive legislatures. These and other sentences read more like history than like prophecy, as they were. He spoke of the hard times that prevailed, of the virgin forest in which operations were to be begun, and that we have no guides to follow; valuable hints might be derived from European schools, but only hints.

President Williams proceeds to discuss the branches of study that should be pursued. As to manual labor he thinks "it ought chiefly to board the student, leaving but a few expenses incumbent on him."

"At the outset we are met with the objection that all attempts at associating labor with the acquisition of knowledge, in seminaries of learning, have proved failures. Sometimes, however, the labor has been mere steady drudgery in close apartments, and was illustrative of no truth. Sometimes labor has been permitted to a portion of the students, who thus elected to eke out their means, while a larger class of daily associates were entirely exempt. Thus castes were created, where, of all the world, there should exist a warm and brotherly sympathy. That manual labor is incompatible with intellectual growth, is contrary to philosophy and experience. Sedentary employment is much more likely to be so. Vigor of body gives vigor to the brain. In the Polytechnic schools of Europe, and at the military academy at West Point, in our own country, the student is often engaged in severe physical exercise for many hours daily. But there, culture of mind and body are indissolubly connected, and the exercise becomes with many, the charm of their student life. Surely the labor that creates instead of destroys, and which causes the earth to bloom with luxuriance and beauty, and groan under its abundance, should be as captivating as that which is bestowed in reducing butchery to an exact science, and which recognizes occasional desolation of the earth, and wholesale destruction of the race, as a necessary and normal condition."

"But if manual labor has failed in all other colleges, it ought not to fail here, where it is inseparably connected with the acquisition of knowledge. Thus allied, the employment should be a charm instead of a drudgery. Practical labor in this institution is the vital, cementing, invigorating influence, that will give it dignity, and it is hoped, complete success."

At the close of President Williams's inaugural, Governor Bingham addressed the assembly. He spoke of the new college as designed "to elevate and dignify the character of labor." He spoke of science, saying: "Science and art are now uniting their labors, and are drawing mutual aid from each other on the farm, as they have for some time been doing in the manufactory and in the shop of the artisan. A new era is dawning upon the vision of the farmer—new light is illumining his path, and a new interest and new pleasures are urging him on to improvement. His intellect comes to the aid of his hands; and as he traces effects to their causes, searches for the reason of his failures and disappointments, familiarizes himself with the operations of nature, and devises improvements in his art, his interest is increased, his profits are greatly enhanced, and he appreciates the full dignity of his chosen pursuit. Science is probably capable of rendering more important aid to husbandry than to any other branch of labor, and presents a wider field of useful study to the cultivator of the soil, than to any other class of society." Gov. Bingham closed with saying:

"Thus, with the liveliest anticipations, and highest hopes of success, we welcome the free Agricultural college among the institutions of learning of the State of Michigan, and bid it God-speed. Long may it flourish, an honor to its founders and an honor to the State."

The Board of Education consisted of Hiram L. Miller, Saginaw; John R. Kellogg, Allegan; Rev. Geo. Willard, Battle Creek; Ira Mayhew, Superintendent of Public Instruction, Secretary *ex-officio*.

All these gentlemen took an active part in the enterprise. Mr. Miller resigned his place in July, greatly regretted by the board, and Mr. Witter J.

Baxter, of Jonesville, took his place. Mr. Willard has more than once lectured before the members of the college.

In 1859, Mr. Mayhew's term of office having expired, Mr. John M. Gregory was elected Superintendent of Public Instruction, and became *ex-officio* Secretary of the Board of Education, and exercised a controlling influence in the affairs of the State Agricultural College. Except for these changes, the Board of Education, with the same membership, managed the college up to April, 1861, when it was transferred to the care of another board.

At the opening of the college, May 13, 1857, the officers were as follows: Joseph Ricketson Williams, M. A., President and Director of the farm; John Clough Holmes, Professor of Horticulture, and Treasurer; Lewis Ransom Fisk, M. A., Professor of Chemistry; Calvin Tracy, M. A., Professor of Mathematics; Robert D. Weeks, Professor of English Literature and Farm Economy, and Secretary; Enoch Banker, Assistant in Chemistry; James M. Shearer, Steward.

Of these first officers, Mr. Williams continued in office until the beginning of the spring term of 1860, when he resigned. Mr. Williams was a Massachusetts man, a graduate of Harvard University of the class of 1831. He was State Senator in 1861, and on the resignation of Hon. James Birney, Mr. Williams became, by virtue of his office of President *pro tempore* of the Senate, the Lieutenant Governor of the State. He was for two years (1854–5) editor of the Toledo Blade. He died very suddenly at his home in Constantine, Mich., June 16, 1861. A fine likeness of him, presented by Mrs. Williams, adorns the college library. He was a person of splendid presence, an eloquent speaker, and of much force of character. His remains were taken to New Bedford, Mass., for burial. Williams Hall is named in honor of its first president.

Of Mr. John C. Holmes, Esq., mention has already been made. He did much to lay out and beautify the grounds, and to give the college a "right start."

Lewis R. Fisk, now D.D. and LL.D., remained in charge of the department of chemistry until the spring of 1863, when he resigned, entered the ministry of the Methodist Episcopal church, preached in Detroit and other places, and became associate editor of the Christian Advocate. Since 1878 he has been the president of Albion College, Michigan. To him is due the excellent position which the chemical department of the college took at the very first. Professor Fisk managed the college successfully as president *pro tempore* by election of the faculty, in the four years' interregnum after the resignation of President Williams.

Professor Tracy resigned his place in the college in 1860, and lives in Lansing, a highly respected citizen.

Mr. Banker is a prosperous lawyer in Jackson, and Mr. Shearer a resident of the township of Lansing. He has been repeatedly honored by votes of his townsmen, and his wife, still living, is remembered by all the older students for her motherly care and authority. She was a woman of rare qualifications for a difficult place.

Mr. Robert D. Weeks resigned his place at the close of the first term, and subsequently went East. His place, as professor of English literature, was supplied before the spring term of 1858, by Theophilus Capen Abbot, the present president of the college, having been made so in the winter of 1862-3.

There being no dwelling houses at the college in 1857, the most of the officers lived in the city, three and a half miles distant, until cottages were completed in the spring of 1859.

During the years 1857, 1858, and 1859, the administration of the college proceeded on the plan on which it started at the first. There were, as the law directed, a summer and a winter term each year. Each term closed with a public examination, to which the citizens of Lansing were accustomed to come in considerable numbers. A radical change was introduced in 1860 by the Hon. J. M. Gregory, and the Board, which lasted for that one year, when the college was transferred to another board.

On the first day the students, sixty-one in number, were divided for classes and work into three divisions. The only catalogues for these years are manuscript ones of my own making. The terms and students were as follows:

1857. First term, May 13 to Oct. 28; total number of students 81; five of these students afterwards graduated.

Second term, Dec. 2 to Feb. 22, 1858; total number of students 101; total number of students the year of both terms, 124, representing 24 counties.

1858. The third term began April 7, 1858, and closed October 27. There were 101 students, of whom 58 had been in attendance the previous year. The fourth term began November 30, 1858, and closed February 23, 1859. There were 86 students in the winter term, 39 of them entering for the first time. In both terms there were 137 different students, representing 21 counties.

1859. April 5, fifth term opened, closed August 5; August 16, sixth term opened, closed November 16. In this year there were 4 Juniors, 32 Sophomores, 48 Freshmen of the 1st division, 32 in the 2d division. Total number for the year, 106, representing 26 counties.

The changes in 1860 make me defer giving these statistics for that year. Since, so far as the general affairs of the college go, these three first years form a group by themselves. During the first year no regular course of study was marked out. In the opening term the most advanced of the students studied arithmetic, advanced algebra, and grammar. The second division studied arithmetic, elementary algebra, and grammar; and the third division, arithmetic, geography, and grammar. In a term or two chemistry was introduced, and in 1858 the faculty formed and presented to the board a four years' course of study. The board directed certain changes to be made, especially that the course should be arranged for two and not three terms a year, and that German and French, which had been proposed as electives, should be left out.

The scheme is given:

1859.

COURSE OF STUDY.—TWO TERMS A YEAR.

First Year.

First Term.—Algebra, History, Analysis.

Second Term.—Algebra, Geometry, Physical Geography, Natural Philosophy, Rhetoric.

Second Year.

First Term.—Geometry, Trigonometry, Chemistry, Botany, Arboriculture.

Second Term.—Surveying, Drawing, Analytical Chemistry, Logic, Book-Keeping.

Third Year.

First Term.—Mechanics, Engineering, Organic Chemistry, Rhetoric.

Second Term.—Civil Engineering, Vegetable and Animal Physiology, English Literature,—Anglo-Saxon Elective.

Fourth Year.

First Term.—Astronomy, Entomology, Veterinary, Mental Philosophy.

Second Term.—Political Economy, Constitutional Law, Geology, Mineralogy, Moral Philosophy.

The labor system began on the plan of making the school one in which the student should nearly support himself by his labor. President Williams says in his report, April 1, 1858: "The paramount object is to enable the student to support himself by his own labor while acquiring his education." He adds: "It is quite probable that balances will be charged against the first classes of students, while successive classes, under the superior facilities the institution will afford for cheapening the cost of articles of consumption, may easily support themselves. It was a dangerous experiment to establish such an institution on any farm, not already, in part at least, capable of the highest cultivation, and ready to yield the maximum of production."

In accordance with this system but one man was regularly employed on the farm. Mr. Hiram Hodges, the farmer, occupied the present herdsman's house, only it was then situated upon the plank, some half mile east of the college hall. The students were to do about all the work, and this work was mostly clearing up land. For the first four or five years the students were divided for work into three divisions; one went out to labor as early as half past six, for the first term at half past five. After three hours of labor they transferred their tools and teams to the second division and went in to lectures and study; a third division worked three hours in the afternoon. Classes of course also were distributed throughout the day. Three hours' work was required on Saturdays, as well as other week-days. Students were paid for their labor according to fidelity and ability. The maximum rate the first year was 10 cents, the second year nine cents an hour. The following are examples of the rating of those times:

In the summer term of 1858, 33 students received the maximum rate of 9 cents an hour for labor; 30 received 8 cents, 15 received 7 cents, and 7 received 5 cents. In 1859 the rating was very minute.

Sixty acres of land were brought under cultivation the first year.

The price of board the first term was $2.50; the second term $2.10; in 1878 $1.75, with 25 cents extra for tea and coffee if used, and 60 cents a week for washing, heating, and lights. In 1859 board was $2.30.

Students of the present day will find it difficult in imagination to realize those early days of the institution. It was a wearisome task to reach Lansing. Three and a half miles over a wretched road through the forest took them to the clearing in which the few college halls were situated. It was not a road to travel often. Prayers were frequently held much earlier than now. On Sundays for the first year the clergymen of Lansing preached at the college in turn. At the close of this year an account of some difficulties which I know of only by hearsay, the board directed the faculty to take charge of these exercises and invite no one. There was always a Bible class on Sundays.

Students were usually crowded four in a room.

The students, however, had the excitement of study, of work, of complaining of their food, and early organized societies for mutual improvement. These, at that time, had no Greek letter names, and were open to any who wished to participate in their benefits. An early society was called the Excelsior Lyceum; the Cincinnatus followed, and the Sons of Demeter. Party politics frequently ran high at the election of society officers. A reading room was started, and amongst others, the Lansing Republican at once sent its paper to the college, and has continued to do so ever since. I am not sure but the same is true of the Journal. The Flint Citizen came from the beginning of 1859, if not from the first, and Mr. E. B. Pond, of Ann Arbor, sent the Argus from May, 1858, until he sold it in 1878. Horace Greeley, who manifested a lively interest in the college, sent the students a box of books, and the students themselves subscribed for five English magazines. So they helped the library and reading room to grow in interest. Besides debates, they had lectures not very infrequently.

Professor Fisk gave the first lecture July 17, 1857; followed by Prof. Fisk, in September, President Williams lectured on "Obedience to Natural Naw." Other lecturers were Rev. George Willard; Rev. C. W. Knickerbacker; Rev. Asa Mahan; President E. B. Fairfield, of Hillsdale college; President Welch, of the Normal school, on "American Deficiency in Taste;" C. B. Stebbins, Esq., a poem; Hon. James Birney; Bethune Duffield, Esq.; William Withington, "Theory of Civilization;" Eugene Tenney, Esq., on "Cuba;" Hon. J. M. Gregory.

The Michigan Female College, presided over by the Misses Abby and Delia Rogers, was at Lansing, and parties and courteous attentions were not infrequent between the institutions—"the whole college, officers and students" being subjects of invitation.

Then there was a splendid meteor in May, 1857, exploding and shaking houses; a splendid comet in September, 1858, rising before the sun, and lingering after sunset; and a grand illumination with bonfires, and speeches by officers and students, September 1, 1858, for the laying of the Atlantic cable. There was always something for the busy heads and hands.

An occasional public exercise gave some variety to life.

The first public exhibition was November 16, 1859. There was music by a quartette and the following original pieces:

On chemistry and its practical applications—Essay, Edgar J. Abbott.
Midas—Oration, Wm. M. Greene.
Stems of Trees—Essay, Gilbert A. Dickey.
Mathematics—Essay, Charles J. Monroe.
Sources of Error in Investigation of Truth—Oration, Charles E. Hollister.
Whisky—Essay, Allen Benton Morse.
The Anglo Saxon Race—Oration, W. Wallace Preston.
Iron—Essay, Albert N. Prentiss.
Patriotism—Oration, Seneca N. Taylor.

Of these speakers Messrs. Dickey, Hollister, and Prentiss afterwards graduated. Mr. Dickey was killed in battle. (See report for 1881–2, page 29). Mr. Morse gave an arm in the service, and in 1875 was State Senator from Ionia, where he still resides, a lawyer. Mr. Charles J. Monroe was in the State Senate from South Haven in 1883. Both as Senators were of great service to the college. Mr. Wm. M. Greene entered the army in August, 1862, and was killed, as second lieutenant, January 29, 1863, near Cumberland River. He was one of the most excellent of students and of young men. Seneca Taylor became a lawyer but is not living. Mr. Hollister is a farmer in this State. Mr. Prentiss is Professor of Botany in Cornell University.

During the second year of the college Mr. W. W. Cochrane was instrucor in book-keeping from June 17 until his death at his home in Detroit, September 29. Mr. Cochrane was from Cora Linn, near Scotland, and was much beloved.

The students, indeed, had an easier time than those who administered the affairs of the college.

The $56,320 appropriated from sales of Salt Spring lands, given in 1855, and the $40,000 appropriated in 1857, were entirely spent before the opening of this college year (1858). A monthly allowance of $500 was borrowed, and by the close of the year the college was $13,000 in debt.

The difficulties of establishing a college in the forest, three and a half miles from the nearest village, had been underrated. Prices had greatly advanced since the undertaking had commenced; hard times, with frequent failures, and general distress prevailed. The year 1858, too, had been a sickly one at the college. The students were, however, loyal, and had laid a mile and a half of tile drain, had put over a hundred acres into crops. The present apple orchard was planted in 1858.

1859.

With the year 1859 the affairs of the college came largely under the management of the Hon. John M. Gregory, who had been elected to the superintendency of Public Instruction, an office which he filled with great ability for six years. The Board of Education remained unchanged, the Hon. George Willard being the president of it.

March 7, 1859, President Williams resigned, before the opening of the spring term, leaving an interregnum in the office, which continued for four years.

At the same time Mr. Holmes also resigned his place (although it was resumed afterwards in 1860). R. F. Johnson, Esq., editor of the Michigan Farmer, became superintendent of the farm for the year and secretary of the faculty. Henry Goadby, M. D., entered on duty as professor of entomology and physiology, occupying the house vacated by President Williams, and now, 1883, occupied by Secretary Baird. The preparations of Dr. Goadby were of exceeding nicety (as for example the nervous system of a spider), and rare beauty. He lectured during the year. He died some years ago at the house of his daughter in Milwaukee.

Mr. Cleveland Abbe, M. A., of the University of the city of New York, came as instructor in civil engineering and drawing. Mr. Abbe is now the meteorologist of the signal service at Washington, and well known to readers of astronomical and other scientific journals.

Silas A. Lane was steward of the Boarding Hall. Towards the close of the year visitors were appointed: P. Bills, of Tecumseh, and T. T. Lyon, of Plymouth.

NEW DEPARTURE, 1860.

There had been in 1859 a good deal of discussion as to what an Agricultural College ought to be, and to teach. Hon. Jno. M. Gregory, *ex officio* Secretary of the board, at last developed a plan to make the college more strictly a technical school, like the medical school. The plan is given in detail in his report, as Superintendent, for 1860, pages 41 to 59. It was to advise with the board regarding these changes, that visitors, Mr. T. T. Lyon and Mr. P. Bills, were appointed.

The scheme embraced a course of one year preparatory study, and two years professional study, in six departments 1. Theory and practice of agriculture; 2. Agricultural chemistry; 3. Civil and rural engineering; 4. Botany and vegetable physiology; 5. Zoölogy and animal physiology; 6. Horticulture; and 7. Practical farming.

In November, 1859, the board met in Lansing, and after discussion, adopted the new plan. The professors at once resigned their places, and their resignations were accepted. In December, 1859, the boarding hall—always a source of trouble—was let out for the year 1860, to Mr. Silas A. Lane, with an engagement to give good board at $2.50 a week. The plan was not successful, and in December, 1866, the boarding hall was put in charge of the faculty.

February 1st the spring term opened. Lewis R. Fisk was professor of chemistry, and by election of the faculty, president *pro tempore.* Theophilus C. Abbot was professor of civil and rural engineering, and treasurer, which latter office he had held in 1858 and 1859. George Thurber, M. D., of New York City, and now and for many years one of the principal editors of the American Agriculturist, was professor of botany and vegetable physiology. Manley Miles, M. D., of Flint, State Zoölogist, was professor of zoölogy and animal physiology. John C. Holmes was superintendent of the horticultural department.

James Bayley, ex-President of the State Agricultural Society, and said to be one of the best farmers of Oakland county, was superintendent of the farm.

Some departures were permitted from the new course in the case of students who were here in previous years under a more literary course of study, and Mr. Robert Hall Tripp, a graduate of the University the next year (1861), and subsequently Professor of Latin in the University of Minnesota, was employed as an instructor.

There were, in 1860, 8 Juniors, 17 Sophomores, and 24 Freshmen and preparatory students,—in all 49, representing 21 counties. This falling off in the number of students has generally been attributed to the change in the plan. The first term began February 29 and continued until August 7. The second term began August 14 and closed with a Junior exhibition November 1.

In the first term the studies might all be termed professional except the pure mathematics. The scheme was: 7:45 A. M., Natural History, Preparatory and Freshmen; 8:45 A. M., Juniors in Chemistry, Freshmen in Trigonometry; 9:45 A. M., Juniors in Mineralogy and Botany; 10:45 A. M., Juniors in Geology, Freshmen in Botany; 3 P. M., Preparatory students in Physical Geography; 4 P. M., Preparatory class in Algebra.

In the second term Whately's Rhetoric and Logic were taught by Mr. Tripp.

March 26. Bell rung at night to call attention to a beautiful corona of the northern lights.

May 9. Abraham Lincoln nominated for the Presidency at Chicago.

Sept. 6. The college students in uniform paid a visit to Governor Wm. H. Seward who was in Lansing. They were drawn in a car decorated with appropriate devices, clusters of rakes, hoes, axes, chains, etc. The address to Governor Seward was replied to by the Governor most happily.

The school year 1860 closed with a Junior exhibition November 1, which was participated in by twelve students, ten of whom afterwards graduated.

The college had 25 acres in wheat, 30 in corn, 15 in oats, 3 in potatoes, and 40 in hay. The stock was valued at $1,401. The appropriation made to the college for 1859-60 was $37,500. With this sum the Board of Education paid the large indebtedness of the previous two years, and at the close of the year 1860 the college was virtually free from debt. The buildings consisted of the present (1883) college hall, a boarding hall since burned, the present carpenter's shop, used as a barn, four dwellings for professors, and the herdman's house, then in the orchard. The public highway ran through the grounds between the professors' houses, and there was not a field clear enough of stumps for the use of a mower.

1861.

REORGANIZATION OF THE COLLEGE.—CREATION OF A STATE BOARD OF AGRICULTURE.

The Superintendent of Public Instruction, the Hon. J. M. Gregory first, and afterwards the board of education, recommended that a new board be created to have charge of the State Agricultural College. It had become the policy of the State to commit each of its institutions to a board of its own, as it has more recently, to have in the Legislative houses a standing committee upon each.

There was besides considerable dissatisfaction with the cutting down of the course of study, and the displacing from it of literary studies. The old idea of the founders had been, to quote from an article in the Detroit Tribune, written by Mr. W. D. Cochrane, not long before his death: "The grand idea that self-sustaining labor can go hand in hand with mental culture and refinement of taste." The feeling prevailed amongst farmers that in their own institution their sons were to receive an education not inferior to that given in any college.

In December, 1859, after the adoption of Mr. Gregory's plan, the matter came up in the executive committee of the State Agricultural Society, and a committee was appointed to inquire into the condition of the college and to report in October. This committee, consisting of James Bayley of Troy, Dr. George K. Johnson of Grand Rapids, and Frederick Fowler of Hillsdale, reported that the objects of the college were: 1st. The explaining of the philosophy of agriculture, imparting a knowledge of the laws of nature that underlie the cultivation of the soil; and, 2d. Affording mental culture and discipline to enable the student to comprehend and reason about the laws. They say: "As every farmer must be a citizen, as his rights of property and person are both affected by the constitution of society, and as his habits of thought are in great part formed during his collegiate course, he is certainly as much interested as any one can be in securing a thorough and substantial education. * * Our sons should not be satisfied with anything less than a full course in science and literature." They recommend the transfer of the care of the college to a State Board of Agriculture. The report was adopted in December, 1860, and a committee appointed to memorialize the Legislature on the subject.

A bill to this effect and to re-organize the college was introduced into the Senate, and was much discussed in the committees there, and by the newspapers outside. Mr. Williams, ex-president of the college, was a member of the Senate, and his influence is plainly visible in the provisions of the bill. Mr. J. C. Holmes was also freely consulted, as is shown in various manuscript memoranda. Two curious provisions of the printed bill were excluded before its passage. The one forbids the requiring of attendance of students at any religious exercises if, of age, he objects, or if either parent objects. The other forbids the existence of secret societies of students. The bill in the Senate was in charge of Hon. Ira H. Butterfield. It was passed by the Senate by a vote of 24 to 5.

In the House a bill creating a State Board of Agriculture was passed with but one negative, but not being approved by the Senate committee, the Senate bill, when it came down to the House, was passed instead by a vote of 58 to 18. Hon. J. Webster Childs had charge of the bill.

With few changes the organic act under which the college is managed exists to-day as it was passed in 1861. The law is to be found in this volume, page 181.

The persons who were to constitute the first Board are named in the law, Sec. 36. They all served the periods for which they severally drew lots, except Mr. Silas A. Yerkes, of Lowell, Mich. He met two or three times with the Board, and in October resigned his place to enter the army. He entered as second lieutenant of the 13th infantry, became captain Feb. 26, 1863. He was wounded at Chickamauga Sept. 19, 1863, was brevetted major for meritorious conduct, and discharged when no longer able to serve his country as a soldier, May 15, 1865. Mr. Yerkes's place was supplied, by election of the Board, by Abraham C. Prutzman, of Three Rivers, who remained a member of the Board until 1873. When his term expired he was a member of the Senate, and ineligible to a renewed appointment.

February 27 was the time for the beginning of the term, under the old regime, but by legislative action the opening was deferred until such time as the new board should set for it. The board held their first meeting April 4. Governor Blair, member ex-officio, was elected president of the board, and lots were cast for terms of office. Mr. Philo Parsons of Detroit and Mr. Justus Gage of Dowagiac drew for two years. Mr. David Carpenter of Blissfield and Mr. Hezekiah G. Wells of Kalamazoo drew for four years, and Messrs. Yerkes and Charles Rich of Lapeer drew for six years. Mr. Langford G. Berry was made treasurer.

The 17th of April the term opened. Messrs. Fisk, Abbot, Thurber, and Miles were reäppointed to their professorships in accordance with the course of study required by law, Mr. Abbot taking as his department, History and English Literature. Mr. J. G. Ramsdell, now Judge Ramsdell of Traverse City, gave instruction in Book-keeping, and the laws and rules of business.

A catalogue was issued in 1861, which has been followed annually by others. A report was issued in 1862, and regular reports have been issued since that time, so the record of succeeding events is plain.

Under the new law the Board of Agriculture consists of six appointed members, two being appointed every other year, by the governor of the State. The term of office is six years. The governor of the State and the president of the college are ex-officio members of the board. The course of study is to be of not less than four years, and is liberal in its range, languages being neither mentioned nor excluded. The law is published in this volume, page 181. Soon after the opening of the spring term of 1861, a four years' course of study and an additional preparatory course of one year was adopted.

Although the civil war had broken out, and students were leaving the college to enlist, the attendance was sixteen greater than in 1860.

Since its reörganization in 1861, the college has gone steadily on, making progress and friends.

In 1862 the congressional grant of 240,000 acres was made, and serves now (1883) to yield the college an annual income of $22,000. The present president of the college was elected to his position in November, 1862. The calalogue of 1861 shows a faculty of four professors, an instructor, and a superintendent of the farm. The catalogue for 1883 shows a president, nine professors, a secretary, who is a member of the faculty, a librarian, and six subordinate officers of instruction. The college buildings in 1861 were a college hall, a boarding hall, a brick barn, and five dwellings. By the middle of next year there will be eleven dwelling houses, two dormitories, a college hall, chemical laboratory, botanical laboratory, green house, library hall, astronomical observatory, apiary, a boiler house, and eight farm and garden barns. A library of 1,200 books has grown to 8,000. The stock has increased from a valuation of $1,400 to a valuation of $18,000, and the number of students from 66 to 185. The property at the college is valued at $340,000.

Through frequent reäppointments sixteen appointed members have filled out the terms of twenty-six. The utmost harmony has always prevailed in the Board, and one of the members named in the law, the Hon. H. G. Wells, of Kalamazoo, remained on the Board continuously, usually as its president, from 1861 to the spring of 1883.

The graduates of the college number (1882) 272, and are scattered into twenty-four States and territories, although three-fourths of them remain in Michigan. One-half the graduates are farmers, or engaged in business directly related to farming, and a much larger proportion are in occupations related to industrial arts.

The chair of practical agriculture was established in 1865. The last chair established is that of veterinary, the last before that was of horticulture as distinct from botany, and the addition to the duties of the botanist of instruction in forestry.

In one sense the college has gone beyond its enclosures, for its six annual winter farmers' institutes bring the college men and farmers together in the common discussion of topics, and the future opens a prospect of honorable usefulness. It is, and may it ever remain, the Farmers' College.

THE SOURCE OF THE NITROGEN OF PLANTS.

BY R. C. KEDZIE.

[Read at Armada and Galesburg Institutes.]

The source of the nitrogen of plants has been to agricultural chemists what the northwest passage through the polar sea has been to navigators. The difficulties in the solution of each problem have been correspondingly great, and the fascination of defeat which challenges new endeavor has tantalized both classes of explorers. The northwest passage is not thrown open to the world's commerce, and the sphinx nitrogen still propounds her unsolved riddles by the wayside of the world's most useful calling. For a novice like myself to enter a field which has been explored by Priestley, Sennebier, DeSaussure, Boussingault, Ville, Lawes, Gilbert, and Pugh, suggests Pope's stinging line,

> "Fools rush in where angels fear to tread."

Yet, we should remember that most of the valuable discoveries in science have come from the united contributions of many minds, and suggestions from unexpected sources have sometimes proved of great importance. We must remember that truth is discovered, not invented. A person of very ordinary ability may yet find a most precious gem, or a golden nugget of priceless value.

HISTORY.

Dr. Priestley was the first person to experiment upon the influence exerted by a plant, during active growth, upon the air surrounding it, and he came to the conclusion that a certain small amount of atmospheric nitrogen was taken up by the plant. Ingenhouz agreed with Priestley that plants, during active growth, took a certain quantity of nitrogen from the air and combined it into plant tissue. Sennebier and Woodhouse, from their experiments, came to the opposite conclusion, that plants are incapable of fixing in organic form free nitrogen. DeSaussure made careful investigations, and concluded that plants not only did not take up free nitrogen, but on the other hand, they gave off nitrogen during active growth.

The subject was left without further experimental investigation for nearly thirty years, when Boussingault, in 1837, began his careful and exhaustive investigations, which were carried on for many years. He came to the conclusion that plants do not derive any of their nitrogen from the free nitrogen of air, or from uncombined nitrogen dissolved in water.

In 1849, Ville, of Paris, objected to Boussingault's method of experimenting, that plants could not make a normal growth in such a confined body of air as that contained in a glass bottle or globe. He repeated Boussingault's experiments, but used a room glazed with glass in place of a glass globe, and announced as the result, that while cereals produced a crop containing only two or three times as much nitrogen as was contained in the seed from which they grew, cress, sunflower, and colza produced in the crop 25 to 40 times as much nitrogen as was contained in the seed. Ville, therefore, announced as the result of his experiments, that while certain kinds of plants have little or no power of taking up free nitrogen, other kinds of plants have the power of combining with free nitrogen and using it in building up their azotized tissues.

Such contradictory results reached by two such distinguished scientists provoked a lively discussion, and, in the interests of harmony, and to establish scientific truth, a commission was appointed by the French Academy, with such eminent scientific names as Dumas, Regnault, Payen, Decaisne, Peligot, and Chevreul, to repeat the experiments of Ville and report the results to the Academy. The experiments were made at the Museum of Natural History in Jardin des Plantes in 1854. Some accidents in the course of the experiments threw difficulties in the way of reaching the fullest results desirable, but the commission found evidence of some gain of nitrogen during the growth of the plants, and finally made this report: "That the experiment made at the Museum of Natural History by M. Ville is consistent with the conclusions which he has drawn from his previous labors." Not a very hearty endorsement.

Other French experimenters entered the field about the same time, and the general results at which they arrived were adverse to the conclusions of M. Ville.

ENGLISH EXPERIMENTS.

In 1857, '58, and '59, Lawes, Gilbert, and Pugh carried out an extended and most carefully conducted set of experiments at Rothamsted, in which every conceivable source of combined nitrogen beyond the known amount contained in the seed was excluded; the soil, the containing vessels, the water and the air admitted to the plant were deprived of every trace of combined nitrogen. The plants were supplied with every substance required for complete growth except combined nitrogen, while an abundant supply of free nitrogen was furnished in the air surrounding the plant and dissolved in the water used during the period of growth. These experimenters used a thoroughness and conscientiousness which inspired the confidence of every person who examined their experiments and studied their methods. The results at which they arrived by a concurrence of all their experiments, were that plants grown in the absence of all combined nitrogen, except that contained in the seed, have no power of taking up free nitrogen and combining it with other elements to form plant tissue. This result is now accepted as a scientific fact by the great body of agricultural chemists except the French school of Ville.

FACTS THAT SEEM TO FAVOR THE FRENCH VIEW.

There are many facts which seem to look in the direction of the views of the French school. 1st. There must be a large supply of combined nitrogen from some source to make good the heavy annual loss of combined nitrogen, or else the supply of this necessary material for plant growth must diminish year by year, and the starvation of the race from failure of plant growth from want of combined nitrogen is only a question of time. This annual loss is caused in many ways: (a) By combustion of nitrogenous materials when much of the nitrogen escapes in the free form; (b) in putrefactive decomposition of organic substances when a part of the nitrogen escapes in free form, and more in the form of ammonia; (c) enormous quantities of nitrates are yearly formed in the soil and by the rivers washed into the sea and lost, so far as land plants are concerned. It is estimated that the Nile daily pours the nitrogen equivalents of 1,100 tons of nitrate of potassium into the Mediterranean, and the Mississippi 2,000 tons into the great gulf.

The loss from all these sources is so great, that the world's supply of combined nitrogen would have been sensibly diminished, if not exhausted, within historic times, if nature did not in some way compensate this enormous waste.

RESTORATIVE PROCESS.

It is claimed that compensation is made in two ways: 1st. By the atmospheric supply furnished in rain water in the form of ammonia and nitrates; but this ammonia is itself the product of decomposition of previously existing nitrogenous bodies, and is not an addition to the world's supply of combined nitrogen, but evidence of waste of the original stock. The waste would be made good only when we recover the whole of the ammonia contained in the rain, but three-fourths of the rain falls into the sea and not on the land. The atmospheric ammonia is a waste of the world's stock, and we recover in the rain only 25 per cent of this waste. But the average atmospheric supply of combined nitrogen is only eight pounds to the acre—an amount insufficient to compensate for natural waste, and entirely inadequate to supply the wants of any crop. 2d. Nitrification in the soil is adduced as one means of supplying the necessary amount of nitrogen in the active form, and it is unquestionably a chemical process of vast significance in agriculture. But nitrification is mainly the oxidation of nitrogen compounds in the soil, and not a process of accumulating free nitrogen to any great extent. It is, in fact, a step in the direction of waste of combined nitrogen, for the investigations of Bretschneider, of Silesia, show that while nitrates in large amounts are annually formed in every fertile soil, they do not remain and accumulate year by year, but are annually washed out and disappear in the drainage water, and are finally swallowed up by the all-devouring sea.

Neither the atmospheric supply of combined nitrogen nor that supplied by nitrification in the soil seem to be sufficient to supply the demands of growing crops and to make good the natural waste of combined nitrogen constantly going on. There must be some restorative force at work beyond anything we have named, to preserve the stately poise and balance which characterize nature's handiwork.

INFERENCES FROM FIELD-CULTURE.

When we examine and scrutinize closely the results of field operations in agriculture, the French school seem to score a still stronger point in favor of their theory of plant accumulation of nitrogen from its free form. Two propositions have been laid down as axioms in agricultural chemistry: 1st. The composition of the manurial matters to be used to secure the best development of any plant is to be determined by the composition of such plant; if the plant is especially rich in phosphorus, potassium, silicon, or nitrogen, then such predominant substance should be abundantly supplied in the manure, unless the soil already contains a sufficient amount in available form. 2d. The exhausting influence of any crop is to be measured with reference to any element by the amount of this substance which the crop removes from the soil. These propositions appear like self-evident truths, but when tested by actual trial in field practice they often break down in ignominious failure. Take two representative crops such as wheat and clover: A crop of wheat of 30 bushels and 25 cwt. of straw, removes about 45 pounds of nitrogen per acre; a crop of clover hay of 2½ tons removes about 108 pounds of nitrogen. The wheat contains a relatively small amount of nitrogen, and should not be benefited by nitrogenous manures; but the clover contains a relatively large amount of nitrogen, and should be especially benefited by such manures; but in actual practice we find the facts are the reverse of this. The wheat is especially benefited by increased supplies of active nitrogen, whereas clover is not appreciably benefited thereby. Again, the clover removing so large an amount of combined nitrogen, which the wheat so much needs for its full development, the wheat crop following clover should give a much smaller production than it would when following some crop less exacting in its demands for available nitrogen; but in practice we find the wheat much better after a crop of clover. These self-evident truths are found to be evidently false so far as nitrogen is concerned. How shall we explain the anomaly that a crop which is indifferent to nitrogenous manures, but removes the largest amount of nitrogen in its product, should yet be the best preparative for a crop requiring an abundant supply of combined nitrogen for its full development? Ville explains it easily and satisfactorily by saying that the clover obtains its supply of nitrogen from the air, and leaves a surplus of this air-derived nitrogen in the soil in the form of roots and stems for the use of the subsequent wheat crop, which lacks this power of air-accumulation. The clover is thus a "producer" and wheat a "consumer" ofcombined nitrogen. Boussingault and Lawes reply: "The explanation is inadmissible, because plants cannot assimilate free nitrogen, as our experiments have abundantly demonstrated." The answer is silencing if not satisfying, but it is merely negative where we want positive information—it is giving us a stone where we ask for bread.

If we concede that clover cannot obtain its supply of nitrogen from the free nitrogen of air, the question remains whence does the clover derive its large supply of nitrogen under circumstances where wheat would fail to secure its smaller supply? Not from atmospheric ammonia and nitrates; not from nitrates or ammonia existing in or formed within the soil, because these forms of active nitrogen would be as available for wheat as for clover during the period of active growth. Since the researches of Boussingault, Lawes, Gilbert and Pugh compel us to reject the doctrine of air assimilation of nitrogen, the discussion is narrowed down to this proposition, that the clover must find *in the soil* some form of combined nitrogen from which it may derive an adequate supply, and that wheat is incapable of obtaining a satisfactory supply from such source; in general terms, that clover and wheat are widely distinguished from each other in their power of supplying themselves with nitrogen from some inactive form of that element existing in the soil.

In all cultivated soils we find a certain amount of organic matter called collectively *humus*, the remains of vegetable matter which has undergone more or less complete decomposition in the soil. This humus contains a small amount of combined nitrogen in the form of ammonia, or capable of being given off in the form of ammonia when the humus is heated with some alkaline substance; but the humus also contains a much larger amount of nitrogen incapable of being driven off in the form of ammonia by heating with alkalies, and has been called "the inert nitrogen of the soil." This inert nitrogen is usually regarded as incapable of supplying plants with nitrogen, and in this respect is classed with the free nitrogren of air. The humus of the soil containing on an average 2 per cent of inert nitrogen, there are present in each acre of soil from 3,000 to 6,000 pounds of combined nitrogen. The amount of fixed nitrogen in every acre of cultivated soil is enormous as compared with the wants of any crop, and would be abundant for every crop if even a small per cent of it could be made active during the period growth.

There is one remarkable fact connected with humus, that however small the amount of nitrogen in the vegetable material out of which the humus is formed, the humus itself still contains about 2 per cent of nitrogen. This comes from the fact that organic matter, in passing into the humose condition, fixes a certain quantity of free nitrogen, as was first pointed out by Deherain.

HUMUS A SOURCE OF NITROGEN FOR PLANTS.

I now come to the question, *Can this humus, as it exists in the soil, furnish nitrogen for any of our cultivated crops?* Do some orders of plants supply themselves largely from the nitrogen of humus, while other orders fail to secure a sufficient supply from that source? Does the classification of plants into nitrogen producers and nitrogen consumers have any substantial basis?

In this investigation three facts turned my attention to the leguminous plants: 1st. They are but little benefited by nitrogenous manures; 2. They produce a large amount of nitrogenous material per acre; 3. They thrive best in soils containing a good supply of humus.

In entering upon an investigation of the capacity of humus to afford a supply of nitrogen to growing plants, I do not forget the valuable contributions on this subject by Prof. Johnson, given in peat and its uses, and of Prof. Storer, in bulletin of the Bussey Institution, 1874. These distinguished chemists and experimenters used maize and buckwheat only, and did not direct their attention to a comparison of different orders of plants, in respect to their relative power of obtaining a supply of nitrogen from humus.

Having had my mind stirred up on this general subject of nitrogen-supply for plant growth, by a correspondence with Hon. George Geddes, of New York, I laid before the State Board of Agriculture, in March, the plan for a series of experiments on this subject, and with their sanction I entered upon the work. I make the following extract from my experimental note book: March 3d, 1882. "Experiments to determine the source of nitrogen of plants, and in particular to determine whether the inert nitrogen of the humus of soil may serve as a source of nitrogen for clover and other leguminous plants, and whether cereals can obtain their supply of combined nitrogen from the same source.

"In these experiments I propose to use clean sand as the mechanical element of my experimental soil, the sand having previously been ignited so as to expel all forms of combined nitrogen; swamp muck to represent the humus of soils; freshly ignited wood-ashes and a pure superphosphate of lime to represent the mineral elements of plant growth; the soil for each kind of plants to be placed in new and clean flower-pots (7-inch pots), these pots to be kept in a glazed room screened from rain and dew, but freely exposed to the air; the plants to be watered with distilled water, free from ammonia." Subsequent examination of the distilled water showed a small amount of ammonia (one part in 10,000,000). As my experiments were to be differential rather than absolute, and the amount of ammonia conveyed to each plant would be substantially the same, I disregarded the ammonia accidentally present. The superphosphate was made by burning bones white, decomposing the bone-ash with pure sulphuric acid and neutralizing excess of acid by caustic potash. Aside from the small amount of ammonia in the distilled water, and the known amount of nitrogen in the seed, the plant during growth was thus cut off from all nitrogen except the air supply and the nitrogen of humus, but at the same time was supplied with all the other chemicals of agriculture. In most of the experiments the seeds were sprouted in clean moist sand, in order to eliminate any possible supply of nitrogen from decomposition of seeds that failed to grow. In most of the pots four seeds were planted. Probably I would have secured better results if I had raised only one plant in each pot.

My first set of experiments were almost a total failure on account of using too large quantity of wood-ashes, but a new series was started at once with new pots and filling.

Three kinds of plants were used: Medium red clover, wax beans, and Clawson wheat. The clover seed was very small, 630 seeds weighing one gramme, or very nearly 40 to the grain; four wax beans weighed one gramme, and 23.4 grains of wheat weighed one gramme. Seeds planted May 6, and gathered for examination August 8.

PLANT DEVELOPMENT.

Wheat. In the early stages of growth the wheat plants came forth with vigorous growth, giving promise of outstripping all the others. This continued till the store of plant food in the seed was entirely exhausted, when growth was somewhat checked; many became spindling and sickly, unable to support the partly developed stem which reclined on the soil, were attacked by fungi, and about one-half died before the close of the experiment. Of those that survived, the upper leaves remained with some vigor of growth, while the lower leaves withered. The best pot of wheat plants was taken as the representative,—four plants; two of these had two stalks each, and two only one stalk each; the roots had made a firm mat all around the inside of the pot, but most abundant at the bottom; two or three nodes in the stalks but no formation of head, development seeming to have been arrested when the head should form. The four plants when washed clean and dried in steam bath

(212 F.) weighed 6.65 grammes, or 39 times the weight of the original seed. Plant 25 inches high when leaves stretched to full hight.

Wax Beans. The beans while slow to start, made good growth and full development, *i. e.*, produced flowers and seed. Seven plants made this complete growth and produced 35 well-developed beans. Some of the plants made imperfect early growth in consequence of difficulty of freeing the cotyledons from the leathery covering of the wax bean, but all that finally grew made sufficient development to mature seed. A pot with three plants was selected as representative because the other pots had only two plants each. The plants were 15 inches high; had in all six pods and 18 beans, besides four unfruitful pods; 41 leaflets, and together weighed in dry state 16.70 grammes, or more than 22 times the weight of the original seed.

Red Clover. Plants made a feeble growth at first, but soon manifested a vigor that astonished all. The growth was so strong and the development so complete in a number of the pots that it was difficult to decide which one to take as the best representative, but No. 17 was finally selected. This had four plants with eight stalks in all, measuring 26 to 30 inches in length, 16 clover blossoms and one bud, and a large quantity of vigorous leaves. On taking up the plants the flower pot was lined with crowded and interlacing roots. The dry weight of the four plants was 22.33 grammes, or 3,176 times the weight of the original seed. The relative appearance of the plants in these three pots is exhibited in the photograph bearing the card,

SOURCE OF NITROGEN HUMUS IN THE NATURAL STATE.

There has not been time since taking up the plants to make analysis to determine the increase of nitrogen in the plant over that contained in the original seed.

HUMUS DEPRIVED OF AMMONIA.

In order to distinguish between the ammonia of humus and the inert nitrogen of humus in plant growth, I deprived a quantity of humus of free ammonia so far as could be done by boiling the humus for three hours with a quantity of caustic lime. This humus was then mixed with a quantity (three parts) sand, wood ashes, and superphoshate added as in the first series, and a set of plants grown under the same condition as the first series. The growth of all the plants was less vigorous than with humus in the natural state. The plants were removed from the soil August 8 and dried in a steam bath at 212° F. until no further loss of weight.

Wheat. Three plants in the pot; radication superficial and defective; leaves lifted to full height measured thirteen inches from surface of soil; the older leaves dead and withered, but newer leaves were green but feeble. The total weight of the three plants 1.05 grammes, or eight times the weight of seed.

Beans. Four plants in the pot; roots coarser than in pot containing humus in natural state, and not so well distributed in soil; plants twelve inches high, and there were eleven matured beans on the four plants; weight of four plants 7.6 grammes, or 7.6 times weight of seed. While the relative weight as compared with seed was less than in wheat, the growth was perfect, each plant producing seed, and the eleven matured beans were a striking contrast with the wheat, which gave no hint of formation of head.

Clover. The clover exhibited a fair amount of vigor, producing stalks 21 inches high but no blossoms. The roots were fairly developed and somewhat evenly distributed, but lacking in the mass of fine rootlets seen in clover in the first experiment. The dry weight of four plants was 10.22 grammes, or 1597 times the weight of the original seed.

The comparative development of the plants in this experiment is exhibited in the photograph bearing the label,

SOURCE OF NITROGEN—HUMUS DEPRIVED OF AMMONIA.

In these experiments I have made no attempt to determine changes which may have taken place in my experimental soil. Nitrification, production, absorption, or loss of ammonia I have passed by in order to fix my attention exclusively upon the relative powers of plants to derive a supply of nitrogen from the humus of the soil. I want to settle one question at a time.

As no analysis has yet been made of the products of growth, I offer no conclusions at this time; indeed, these experiments are merely preliminary and tentative. I propose next year to repeat, modify, and extend these experiments in order to eliminate any sources of error which I may discover, or which others may point out, and criticisms and suggestions will be thankfully received from the members of this society. If by these experiments some contribution shall be made towards placing agriculture upon a scientific basis, my highest ambition will be rewarded.

FARMING AS AN OCCUPATION.

BY R. G. BAIRD, SECRETARY STATE BOARD OF AGRICULTURE.

[Read at Hastings and Armada Institutes.]

A great deal of good advice has been given on the subject of "Choosing an Occupation." How much of it has been heeded is another matter, for advice, you know, is something like medicine—it is easier given than taken. The subject, however, is certainly an important one, as it must necessarily bear an intimate relation to our well-being and usefulness. I can only think of one other choice that almost anywhere outside of Indiana is likely to affect us more seriously and intimately, and that is the choice of a wife.

With reference to a partner for life, I suppose that in this country it is almost always a voluntary choice. Although when we look upon some couples that appear to be so much more married than mated, it seems difficult to imagine this to be true. With regard to our occupation, however, I doubt whether in some instances it is altogether a matter of choice. With some of us we are, as it were, caught up in a current of circumstances, and either passively drift into our occupation, or are violently driven upon it by a force, or combination of forces, which we are almost powerless to resist. Still, in most instances, there is to some extent an element of voluntary choice, and to those who may be asking for themselves or for their children in what pursuit they would be most likely to find profitable and agreeable employment, allow me to present a few thoughts showing some of the advantages of agriculture as an occupation.

There are some things about farming, concerning which, we would all have the same opinion. We should all agree, for example, that it is a very necessary vocation. There are some occupations whose influence is evil, and society could better get along without them,—occupations in which men are employed to the injury of their fellowmen. There are others again that although beneficial might be dispensed with better than farming, because they are not fundamental. The merchant and the lawyer, the doctor and the minister, the teacher, and even the politician have their use, and must always find a place in all well regulated communities.

We want the messenger of the gospel to remind us of our higher relations and direct us in the heavenward way. We want the teacher to mould the plastic mind of youth. We want the lawyer to help us out when we get into a bad scrape. And the good doctor, too, who is ever so much more useful since he stopped bleeding in the old-fashioned way, and only bleeds our pocketbook a little now and then; and a good right he has to do it, for he tells you more about how to preserve your health and keep disease away, than a whole generation of them used to do. And how could we do without the politician; we should never know, if he did not tell us, the terrible danger we were in and how certainly our country would be ruined if he should not be elected. Still, when you come to place these occupations alongside of that of the men whose labor feeds and clothes us, you will conclude that important as they all are to society, we might possibly get along without some of them better than we could get along without the farmer. Thus we should all agree that farming is a very necessary vocation, and that it is vitally fundamental, all the other industries being dependent upon it. It is also in itself the direct means of support to a larger portion of the human family than all other occupations combined. It is not, however, with reference to the general good, that we propose to discuss the occupation of farming, but with reference to the individual. What it is to the man who engages in it as a life work. What it *requires of him* in the way of muscle and brain, of thought and energy, of care and effort, and what it is likely *to give him* in return for this; in its influence upon his manhood, in the usefulness of his life, and the material comforts and rewards that it renders, as compared with the returns that other occupations yield. These are matters upon which we may have almost as many different opinions as there are individuals present.

Let us then consider briefly. First, some of the things that are required on the part of one who would be likely to engage successfully in farming; and secondly, what return he will be likely to receive for his well-directed industry.

First, then, I observe that in order to obtain the best results in farming, a knowledge of the principles of agriculture is necessary, together with a skillful application of them. This is none the less true because some so-called ignorant men have been very successful as farmers. We have known such men; they could hardly write their signature; but, although they were almost as ignorant of what books contained as the team they drove, they were men remarkably endowed in some other ways. Sharp, shrewd observers in regard to cause and effect, and of such indomitable energy and unwearied industry as to make up in large measure for the disadvantages under which they labored, because of their ignorance of the principles which underlie their occupation.

The time, however, has gone by when it is necessary to enter into an argument with those who consider farming a business requiring mere strength of muscle, and as having nothing to do with the principles of natural science. When you look upon the plate of fruit upon your table, whether it be apples, pears, plums, peaches, strawberries, or many other kinds that might be named, to what but the application of the principles of science are you indebted for that luscious fruit? What has made thedifference between those sleek, quiet, contented looking hogs that you now keep, and those cadaverous ones of former times, that would eat their way through the corn crib and squeal for more? Why, the observation and application of the principles of natural science has made the difference.

This it is that has given us our improved breeds of cattle, horses, and sheep; our improved vegetables and fruit; our improved implements of husbandry by which we can accomplish more than four times the labor we formerly could. Why, the man who has nothing but a sneer for what he terms book farming, and who claims that science has nothing to do with farming or farming with science, does not know what he is talking about, and to him the occupation will always be one of drudgery and poorly requited toil. Now suppose we were to turn over to a race of savages, all our improved cereals, and vegetables, and fruits, and sheep, and cattle; let them have the same soil that we have, would not all the advance that has been made soon disappear; some varieties would die out and others revert to their wild condition. In other words, those fruits of the earth, and domestic animals, which it is the object of agriculture to produce and approximate toward their most perfect forms, can only be improved by men who are themselves in an advanced state of cultivation. The idea that any ignorant dolt can make a successful farmer never had an existence except in the brainless head of such a dolt. That man will attain the best results, all other things being equal, who best understands the principles of his occupation, who studies and reduces to practice the most advanced ideas on the subject, so far as his soil and circumstances will permit. Just as the laws that govern and influence navigation must be understood by the mariner, so must the laws that relate to the wants and susceptibilities of the soil be understood by the farmer. As well might the former commit himself and his vessel on the pathless ocean without compass or chart and say, I am going to be practical and feel my way instead of trusting to book-learning, as for the farmer in his calling to ignore the principles that relate to the fertility of his soil and the improvement of his products. We admit that theory alone is as dead and useless as faith without works. We must have practice. But this is not more true in regard to farming than in regard to other pursuits. What is the practice of law or medicine or mechanics but the application of the principles, as laid down in the books, to the details of the business. The lawyer who is ignorant of books, and who has no well defined principles to apply, is not the man to whom you would commit your case. The farmer sustains the same relation to his farm that the lawyer does to his client, or we might better say, that the physician does to his patient, regulating his food, directing his exercise, and so restoring his impaired vitality; therefore, a knowledge of the principles of agriculture, and a skilful application of those principles to his individual circumstances, is demanded of him who would be a successful farmer.

Time will not permit me to point out the almost endless variety of instances in which it might be shown that skill in the application of the principles that relate to farming is constantly demanded, and is of the very first importance. There are peculiarities of soil and climate of which he must be a close observer with a view to adapt his fertilizers and methods of tillage to meet their requirements. Each locality has its peculiar relations to market, that might be profitably considered with reference to a rotation of crops, or with reference to special crops. A systematic arrangement and proper division of work will materially affect the results accomplished within a given time. Like the painter, who, on being asked what he mixed his paints with, answered "brains," so the farmer will find as much need of brains in the pursuit of his occupation as any other man. The farmer cannot bury his mistakes out of sight like the doctor; they remain above ground where they are seen and known by all men. Having thus briefly spoken of what agriculture demands of him who engages in it, let us now notice what it has to give him in return:

First, with regard to the money there is in it. As we are sometimes accused of worshiping the almighty dollar, I thought I might as well put this first. "Money answereth all things," says the proverb. That is not quite true, but, after all, we cannot get along without money, and I would advise you to keep away from any occupation that hasn't any money, if it were necessary to give any such advice.

If the farmer's occupation does not yield a fair remuneration for the thought, and care, and toil that he bestows upon it, then it is not the calling ing that I should recommend, nor the one that you would be likely to choose. I think, however, it can be shown that farming properly conducted will yield, as compared with other occupations, a fair return in money, while the risk of loss and failure is incomparably less in this than in most other pursuits. Because some farmers do not make anything is no proof that nothing can be made at farming unless it can be shown that the cause of failure is not in the man but in the occupation. Although as a class farmers are an industrious, frugal people, yet there are to be found idle, shiftless, worthless farmers who neither achieve nor deserve success. Yet even they manage to live along in a kind of a way, and are generally able to indulge in the luxury of tobacco and plenty of time to smoke it, and of keeping two or three dogs to prey upon their neighbor's sheep or pick up their living in some other disreputable way, (*i. e.* the dogs, I mean, not the men); but to the industrious, intelligent cultivators of the soil, agriculture is not niggardly in the reward she renders for all such well directed industry. In this new country of ours being so rapidly developed, sometimes the return from the investment of capital is out of all proportion as compared with ordinary gains. We are too apt to leave out of consideration the element of hazard and uncertainty connected with such investments, and thinking only of the rapid gain, the mind is apt to become distracted and unsettled and so unfitted for those steady business habits that in ninety-nine cases out of a hundred constitute the foundation of financial success. Farming does not hold out this prospect of rapid gain, neither on the other hand does it involve the risk of moral and financial ruin which environ and so frequently overwhelm the great schemers and speculators of the day. Wealth that is gained without labor is often squandered without wisdom, while that which is acquired by industry is preserved with care and expended with judgment. I have been through most of the older settled counties of this State and find that a very large proportion of the wealth of these counties is in the hands of the farmers. As a rule, the men employed in mercantile business do not become rich. In conversation with one of the leading merchants of Detroit a short time ago I got a sort of inside view of matters. I had just been conducted through the establishment; five floors all occupied with goods; nearly a hundred persons employed. In conversation with this gentleman in his private office I remarked that before I should assume such a care and responsibility as he had I should want to be pretty certain that I could make in about ten years all the money I should want during the rest of my life. He replied that in view of past experience the prospect was not very encouraging. "I could," said he, "show you to-day a number of men who were among the leading merchants of this city ten years ago, who are now working for a daily pittance behind the desks of the men who are the merchants of to-day; who of us may be there ten years from now of course we cannot tell, but it is among the possibilities to which we can look forward."

It is difficult to show just what the profits of the farmer are on any given piece of labor. We might, as is sometimes done, take a given field and crop, estimate the cost of seed, cultivation, harvesting, and marketing, and compare it with the value of the crop. That, however, is not very satisfactory unless we could have the actual account as kept accurately by the farmer himself. Such an account to the farmer must be of great value, as in a few years he would know, with almost a certainty, what he could raise most profitably, and what it was better for him not to try to raise at all.

On general principles we may assert that the margin of profit in farming will depend, as in other occupations, on the order of talent devoted to it and the capital employed in it. Judging from the practice of the average farmer, we think he has a good deal to learn yet on both of these points. The old adage so frequently quoted as though it were a self-evident truth, "He that by the plow would thrive, himself must either hold or drive," is, in my opinion, a piece of unmitigated nonsense. It is a part of the old absurdity that farming simply means manual labor. A man might drive a team or hold a plow excellently, and yet be destitute of nearly every quality that would constitute a good farmer; just as a man might be an expert in the manipulations of setting type, and yet be entirely unfit to conduct a newspaper successfully. Ability to perform some manual or mechanical operation is a very convenient thing to have; it is not, however, of much importance in estimating the fitness of a man for the successful conduct of any business enterprise, whether it be a farm, a factory, or a mercantile establishment. More than that, a man who is going to conduct such an enterprise, must be better employed. He cannot afford to spend his time in mere manual operations, that he can hire done for from one to two dollars per day. Your return will be in proportion to what you give, and as you give. Does not your occupation as well as the Bible teach you that what a man soweth *that* shall he also reap? That and not something else. If you have nothing higher to give your farm than mere manual labor, it will yield just about what manual labor is worth in the labor market, and you must be content to live on that, not because your farm has nothing better to give, but because you have nothing better to give your farm. Give it the enthusiasm of one who loves his occupation. Give it the best intellectual service of which you are capable, leading you to the wisest possible adaptation of means to ends, and with liberal hand it will shower upon you the ampler reward of that higher service.

Whether you agree with me in this position or not, did time permit I could refer you to a great number and variety of incidents in the actual work of the farm, abundantly proving the truth of what I say. I can remember when every one considered it necessary to keep hogs till they were about eighteen months old before converting them into pork. Why? Simply because they did not give it thought enough to find out whether it paid or not, or whether there might be a better way. Bye and bye somebody did give the matter thought, and by careful investigation and experiment established the fact that about one-half that time of keeping will yield the largest profit, thus saving the cost and trouble of wintering and having a larger margin of profit than before. We can all remember when four or five pounds of wool to a fleece was considered very good, and six was something quite remarkable. Now, as the result of knowledge and intelligent systematic effort, the weight of fleece in many flocks has been more than doubled, and the margin of profit more than proportionately increased. What would our fathers have thought of the prices obtained for some of these animals for breeding purposes? We see the same increase in the margin of profit, resulting from more intelligent husbandry, in the production of beef and dairy products. When I was a boy I used to hear it frequently said that there was just a penny a day, between the man who kept his coat on and the man who took his coat off, and it was in favor of the man who kept his coat on. But, many of these people had the idea, as some have still, that the man who took off his coat worked, and the man who kept it on did not. This is wrong; men work as hard with their coats on as men do who take them off, only it is a different kind of work, and it is the work that brings the largest return every time. I think it is safe to say that there is more than a dollar a day, take the world over, between the man who works with his coat on and the man who works with it off, in favor of the former. Remember, I am not speaking of the *idler*, but the *worker* who keeps it on.

The margin of profit in farming will also be in proportion to the amount of capital judiciously employed. I have known some farmers who, in other respects, had excellent practical ideas, but whose practice in regard to the use of capital did much to prevent a larger success. As soon as they made a little beyond their immediate wants, they would put it out at interest. Well, perhaps you will say a little money out at interest surely isn't a very damaging thing. Of course, in itself considered, it is a very good thing, but it might be worth while for some people to ask whether there is not something better. Whether there is not a bank on their own farm in which that money could be made to yield a larger dividend; or better still, whether some of it might not be better employed in improving the minds and manners of the members of the home circle, fitting them to mingle in society with the intelligent and refined. We see comparatively few farms on which a more liberal outlay of capital, if made judiciously, could fail greatly to increase both the pleasure and the profit of the labor expended upon them.

Capital is as truly the sinew of farming as of war. The successful merchant or manufacturer rarely diverts his profits from his business. He is not ambitious to become a money lender as soon as his transactions leave a surplus of profit. He generally adds it to his original investment. Increases his business or improves his methods, carries a larger stock, employs more hands, or purchases improved machinery, and as he can afford it, adding to the comfort and elegance of his home, adapting it more perfectly to the best and noblest development and culture of his family. Why should not the farmer do likewise? He should expend each year a liberal portion of the profits derived from the products of the farm in such permanent improvements as the erection of necessary buildings, the repair of those already on the farm, the improvement of stock, the reclamation of some piece of waste land, the drainage of some wet field, or the fertilization of an impoverished one, or something that will add to the beauty and comfort of home. In short, whatever will add to the pleasure of the home life, or to the taste, convenience, and profit of the farm. The return from such investments will yield something better even than ten per cent. Such a bank will always be able to declare a dividend, and not be subject to stoppage or revulsion. In all business enterprises capital is power, and I should like to see it enforced on the mind of every farmer that its employment is as necessary to the successful pursuit of agriculture as in mercantile and mechanical pursuits, and will be likely to prove as profitable financially. Under the present conditions of farming, brought about in large measure by the settlement of the extensive prairies of the west, and the great advance which has been made in farm implements and machinery, giving us an immense quantity of farm products at a greatly reduced cost of production, it is hardly possible to have large profits on a small farm. So that the old idea of the most perfect conditions of rural life being represented by a "small farm well tilled," must give place to the idea of a "large farm well tilled." This is more emphatically true of farming in the west than in the east. Yet, the most advanced agriculturists of the east fully recognize this fact.

Prof. Sanborn, of New Hampshire, speaking of extensive farming, says: "Large profits are the product only of an extended business under low prices in farming as elsewhere. Large leases have given a rich tenantry to England, while ten-acre farms have clothed the French peasants with wooden shoes. The policy by which we have lost for a long period (that is the policy of the "small area well tilled") is obviously not the one to pursue further. I would till, instead of 10 to 15 per cent of the possible arable land of the farm, 50 per cent at lowest, and thence on, governed by circumstances, up to 60, 70, 80, 90, or even 100 per cent of such land, always including clover as one of the rotation of crops. In order to secure the materials of fertility, I would feed well-bred early maturity animals on home-grown and purchased foods, rich in the elements of plant food. I would use large amounts of purchased chemicals, give thorough tillage, adopt a system of rotation of crops, and substitute machinery for hand-labor as far as practicable. This policy will multiply the gross revenue of our farms from three to five times."

When we remember that only a very small percentage of the men who turn to mercantile pursuits are successful—some claim not more than four per cent—the farmer's slow but sure accumulations are not to be despised. The young men who leave the farm for other occupations, and the older men who sell their farms and go into business, expecting speedier and larger gains, frequently find only too late that they have made a fatal mistake.

Among the varied range of occupations I know of none that furnish better opportunities for man's development, both physically and mentally, than farming. I believe that in any legitimate calling he may preserve his integrity and develop his manhood, and a man's occupation, so long as it is a legitimate one, may not have so much influence upon his character as is sometimes supposed. Every such occupation, however, probably has its advantages and disadvantages as a school of character. Whatever our calling is, we probably find in it some things that foster and some that impede the growth of our better nature—some helps to be thankful for in the development of a true manhood and womanhood, and some hindrances to be overcome.

One of the essential conditions to our best development is a sound body, therefore the most healthful occupation, all other things being equal, is the best. It is generally admitted that the average health of the farming community is better than that of other classes. This is one advantage which the farmer has in the pursuit of manhood over others. It is much easier for one whose circulation is perfect, whose digestion is sound, and whose nerves are steady, to be a man among men, than one who is nervous, thin-blooded, or dyspeptic. Some one has well said, "The profession of agriculture is more favorable to the entire development of the human faculties, to the unfolding and perfecting of this physical, this intellectual, this moral and immortal being, which God has given us, than any other employment. It imparts vigor to the body and to the mind, leaving the soul free from feverish excitements, to embitter, as it were, with its growth the lessons which nature teaches; in fine, it is capable of ministering most successfully of all arts and of all occupations, to wealth, to intelligence, and to virtue." This is becoming more and more true as time goes on, for every improvement in farm implements and methods of operation takes away so much of the drudgery of farming.

Many of the ideas entertained of the desirability of an occupation are, I think, a sad perversion of nature. The prevalence and intensity of the desire to obtain some position in the service of the government, as manifested on occasions that call forth the least hope of realizing anything, is really appalling. There is scarcely a position in the gift of any State officer or Board, or Legislature, from a janitor up to a U. S. Senator, but what the applicants for it will be numbered by tens and even by hundreds. It matters little what the position is, there is the same scramble for almost any office. Of these positions it may be said generally, that they are among the least favorable to the development of character. The young man who happens to be the successful competitor for a clerkship in one of the State offices, thinks he has drawn a prize, and he is truly envied by those who failed to get the position for themselves. But watch that young man year after year. He becomes a sort of machine, he fairly freezes to the capitol. The heaven of his ambition is to retain the office that has proved the sepulchre of his powers. The hell of his fears is the dread of losing it.

I have heard the late Senator Chandler say that if he had a son he would rather give him eighty acres of land in Michigan, than any official position in the government, and the more I know of these official positions the more I think he was right. I sometimes think that many of us sustain about the same relation to farming that our first parents did to the garden of Eden. In youth we go out with light hearts from the rural home, in the hope of finding some imaginary pleasure and satisfaction which its quiet humdrum life has failed to furnish. But as we grow old, there is a light and warmth upon the recollection of these first homes, and we see attractions in farm life that in our youth we failed to see, and we would fain go back to farming, but some flaming sword, it may be poverty, or ambition, or a sense of unfitness, keeps us out from that garden of the Lord.

HOME LIFE.

BY E. J. MAC EWAN.

[Spoken at Cassopolis, Berlin, and Greenville.]

The world is slow to recognize and record the influence of our every day home life on national life and character. Charles Knight, in his popular history of England, makes the elements of national life seven,—civil and military transactions, religion, government and laws, national industry, art, science, and literature, manners and customs, and the social condition of the masses. In all this great muster and parade of wisdom and folly, strength and weakness, wealth and poverty; war with its pagentry of horrors; the long procession of dynasties and kings, nobles and statesmen, prelates and priests; the grand array of churches and cathedrals, rites, and ceremonies; the grand concourse of lawgivers, judges, and jurists; the rise of arts and industries; the triumphs of literature and science; the frivolities of fashion; the magnificence of architecture; the prerogative of nobility and royalty,—in this sevenfold narrative through eighteen centuries, domestic life within the peaceful cottage, advancing in purity, power, and intelligence, has not been accorded a place among those influences which mould national life. Yet here men and women are trained for life's solemn duties and large responsibilities; its lofty aims and vast endeavors. Here poets receive their lyres. Here chieftains are girded for victorious conflict. Here rulers are inaugurated for the obedience of mankind. It may be denied by some that Adam was the first man; woman suffragists confer that distinction upon Eve; evolutionists on the anthropoid tailless ape; but some things taught in the standard book from which we get the notion that Adam was the first man, and which is the source of all that is worthy in our civilization, cannot be argued away. Among these is the sanctity of the home relations. In the quality of the homes of a nation abides the nation's destiny. If they are the nurseries of manly and womanly virtue, schools of thrift, economy, and culture, their natural outcome and expression will be a just and free government, and pure, liberal, social institutions. The loves and delights of such homes afford the best rewards and sweetest consolations of life. But few persons will deny their indebtedness for all that is valuable in their condition or character to the influences clustering around their cradles. Wherever is planted a true home there is a bulwark of the State and a conservator of the best interests of society. Nothing can be substituted for it. The nation rises and falls in character as its homes rise and fall. In the struggle after ideal home life is to be found the solution of more of the ugly problems, social, moral, and political confronting this generation than anywhere else.

Now, to one who has no off-hand, fluent, authoritative opinion on beet-sugar, ensilage, Russian politics, hog-cholera, predestination, potato bugs, or the presidential prospects for '84;—while specialists are showing you the profits of short-horns, long-horns, and no-horns, (skipping horns behind the screen); the best way to cultivate blue-grass, bog-grass, quack-grass, and grass widows; the sure way of turning earth, air, water, and smoke into wealth; of getting to congress and bossing the railroads; it occurs to one whom the State Board of Agriculture sends out to address you, whether he can or not, that a few homely, home-made thoughts on the exceedingly homely theme of "Home Life" will not be inappropriate. It is an old subject. It may have been the theme of vigorous discussion immediately after the devil stole into Adam's and Eve's primitive but luxurious abode, and that enterprising pair gave up gardening and went out into the world to engage in general agriculture and raise Cain. It has been a topic common to press, pulpit, and rostrum, undying and exhaustless. It has created more fiction, sung more songs, uttered more maxims, and inspired more eloquence than any other topic; still we never tire of it. Love is renewed every day, and home is renewed with it. Yet with all the literature and talk on home, few have any adequate idea of what it really is, as an institution. Certainly, it is to a few, a reminder of life's purest joys, best friendships and holiest aspirations. But it is recognized by many, merely as a house divided into apartments, containing a suitable number of tables and chairs, chamber furniture, and edibles,—a place to eat and sleep in, and that only: a sort of private lodging-house where, for convenience or economy, people board themselves. This conception of a home as a convenience, however charming, as a comfort however delightful, as a luxury however elegant, is very inadequate. This classes it with the nest of the bird, the den of the fox, and the cave of the hyena. In the humblest cottage there is much which the eye does not reach. Bench, table, and bed are not the only furniture. The hearth has another fire than that which warms the body. Fancies and impulses are there working through the inspiration of love. The heart cannot live in a place purely material. The animal man is not to be tamed and fed only: but the glorious spirit within him is to receive its share of life and culture from the economy which surrounds him, and mature itself for its awaiting destiny.

Although much of home happiness depends on the externals of home, the construction of houses, adaptation to climate, arrangements for heating, ventilating, cooking, bathing, and all that has to do with animal life; these things must be left to the tender mercy of architects, and to the length of the bank account. A few hints, however, on such of these topics as most affect the inner life of home, may be given. Farmers possess a great advantage over most other classes in owning their homes. For this reason home topics ought to be especially interesting to farmers. The possession of real estate confers upon a man dignity and an air of substantialness. "Who trusteth a man that hath no house, and skippeth from city to city? Lo, the wary landlord asketh him to pay in advance; and if he seeketh private hospitality, behold man turneth him over to the police as a beggar and tramp." There is greater respectability in one's own house twenty feet square and built of logs, than in a rented mansion. Little houses may be the abode of refined people, who choose to surround themselves there with the comforts of life, rather than let happiness shiver on the cold stair of ideality. It is a good, healthy idea, that any one who can afford to marry can afford to buy a home.

There is more danger of having too large a house than too small a one; and farmers are quite as liable to make this mistake in planning a new house or re-building an old one, as other people. They forget that the Tower of Babel on the plain of Shinar, was planned on too grand a scale; that the contractors couldn't pay up, and the workmen struck; and we, of to-day, experience some of the disastrous results of that strike, when trying to communicate with Scandanavian, or Teutonic, or Hibernian help. It wasn't disappointment in love that made Solomon cry out in anguish, "Vanity of vanities! All is vanity." It was the expense of that gorgeous edifice

"On Mount Moriah
Hard by Jerusalem."

France was thrown into bankruptcy by Versailles, and George Francis Train rendered impecunious by his magnificent tavern in Omaha. It is infinitely better to build snug cottages and save snug sums for furniture. Let extravagance and ostentation yield to comfort. A similar mistake is often made in furnishing. In many houses the parlor is the only well furnished room. The chamber, the dining-room, and the kitchen are expertly defrauded for show—simply to please a few morning callers or evening visitors. A happy, healthy domestic life demands, above all, that the home arrangements should have reference exclusively to the family. It is the *family* dwelling, the *family* world. He is a fool who mortgages fireside and table and slumber to the omnivorous public. Welcome friends to your homes, and honor them with generous hospitality, but let fashion, etiquette, and society be subordinate to home comfort and home-bred excellence.

When real comfort and happiness can be had for a small price people are not wise who pay great prices for being wretched. There is no longer any reason why farmers should not have intellectual and cultivated homes. They possess all the sensibilities and capabilities of refinement which characterize humanity. Their boys and girls are just as susceptible to wholesome home influences and education as any. If while the country was new they have been too busy laying the foundations of future fortunes, to study outward bearing and inward culture, now, when our country has reached her majority, they may begin to decorate homes and refine manners. They have the foundation for the finest manners in the world,—good sense, justice, kind hearts, quick perception, and chivalry toward the weak. These qualities ought to bear fruit.

However, well planned and well furnished houses are not the only essentials to happy home life. There can be but imperfect enjoyment without good health, kind feeling, good fellowship and cultured manners. Science and art may invent splendid modes of illuminating the apartments of opulence, but these are poor and worthless compared with the glorious sunlight poured freely and impartially into all our windows; so the common lights of reason, and conscience, and love, and courtesy are of more worth and dignity than the rare possessions which fortune gives the favored few. Wives and children want something besides full purses and good sentiments, fine horses in gilded harness, silks and jewelry; even a flea-bitten lap-dog and a sickly geranium in the window will not suffice. They want attention, counsel, sympathy, heart-succor and heart-support, intellectual and spiritual culture. If they do not have these, who can wonder if home is a place of disorder and distress? "He that provideth not for his own household hath denied the faith, and is worse than an infidel."

In his eagerness to acquire wealth the average American sacrifices health and comfort. He takes insufficient sleep, pays too little attention to his food and personal appearance, has no time for recreation, or mental and spiritual growth, and he demands of his family the same sacrifice. Now in regard to sleep:

> "The innocent sleep:
> Sleep that knits up the ravelled sleave of care;
> The death of each day's life, sore labor's bath;
> Balm of hurt minds, great nature's second course;
> Chief nourisher in life's feast;"

If Ben Franklin ever uttered the *dictum*, "Six hours sleep for a man, seven for a woman, and eight for a fool," he ought to have taken the full eight hours. Lying in bed for laziness is one thing, but defrauding the body of its needed rest is quite another. There may be intemperance in early rising. Take time by the forelock is well enough; but if you take it by the fetlock it won't kick! The fine Durham steers which you are fattening for the fair, you do not punch up at four o'clock in the morning with a pitchfork, and then offer them frozen turnips and marsh hay! Aren't children as worthy of physical culture as steers? Isn't a wife worthy of as much restful sleep? More women are broken down by a lack of sleep, than in any other way. Sleep is as essential as food to vigorous health. Thrift on the farm, as anywhere else, depends on physical vigor; and sound sleep is the best preventive for disease as well as the most effective medicine for irritability of temper, peevishness, and uneasiness of any kind. The bed and its surroundings, then, should receive careful attention. The farmer who has authority at home, who has a set time for going to bed, the sooner after nine o'clock the better, when every member of the household shall be ready for the main business of the night, no matter what is going on at the lodge, hall, ball, temperance club, or prayer meeting, may sing:

"Earth has no sorrows that sleep cannot cure."

This is item number one, for health at home. Number two has a poetical introduction:

"Oh hours of all hours most blessed upon earth,
Blessed hours of our dinners! * * *
We may live without poetry, music, and art;
We may live without conscience, and live without heart;
We may live without friends; we may live without books;
But civilized man cannot live without cooks.
He may live without books; what is knowledge but grieving?
He may live without hope; what is hope but deceiving?
He may live without love; what is passion but pining?
But where is the man that can live without dining?"

Energy, happiness, virtue, and religion depend very largely upon the condition of the stomach. Prof. Blot, who, in magazines and lectures, taught how to fry, roast, boil, bake, steam, and eat, was a real missionary of economy, health, temperance, longevity, and home happiness. Dyspepsia converts angels into bull-dogs, and the liver complaint makes seraphs porcupines. Good bread and tight buttons will do a thousand times more for home happiness than Latin, literary clubs, and high art, together.

The intellectual Hazlett wrote his love: "I never adore you so much as when sitting down with you to boiled mutton and hot potatoes." What wife doesn't know that the way into the man's heart or pocket is through the stomach? Good digestion—good deeds. A well-fed man reasons better, loves more warmly, gives more generously, prays more fervently, and is generally more agreeable than a starveling. As a moral institution, then, and a factor in domestic bliss, even so common-place a thing as victuals must be accorded a high place. "Let us eat and drink well, lest to-morrow we die." Eating may not be the highest kind of enjoyment. We may not be ready to adopt the sentiment:

"Better far than arts æsthetic,
  Crewel-work and peacock fans,
Are these studies diatetic,
  Carried on mid pots and pans.

This is woman's true position,
  In the kitchen's inmost nook,
And a lady's noblest mission
  Is to cook;"

but an oyster-stew, or a chicken-pie is a very good thing when well made. Away with the brown-bread and pea soup philosophy of Graham & Co., who condemn all the delicious dishes which tickle the palate. An old Scotch minister, after a wretchedly cooked meal, retired gloomily to his study, and, when a brother dominie called, was found dismally absorbed in his sermon for the next Sunday.

"And hoo is the warld wi ye to-day?" asked the new comer.

"Everybody will be dommed," was the gloomy answer.

"Hech, mon; you'r no weel in the stummich," answered his friend. "Come and sup wi the wife and bairns."

The minister went and enjoyed a delightful repast. After supper, as he sat over a moderate glass of toddy, his friend asked cheerily:

"Hoo is it wi ye noo?"

"We'll all be saved," was the reply; "all but oor cook. She maun be dommed!"

Roast turkey was not designed wholly for sinners. An Englishman can't fight without beef in his stomach; no more can you plow. Let white-livered, hatchet-faced, thin-blooded, scrawny reformers eat their sawdust puddings, and take short sleep on plank beds; but on the farms, let perfect, physical manhood and womanhood, with the amiability and virtue which accompany good health be encouraged with good, varied, and abundant diet, and not have their pluck and courage knocked out of them by a thin diet of theories and milk. We may indulge in reasonable thanksgiving that among farmers' wives the sallow, skinny, salaratus-fed sisterhood is almost extinct, and in their places stand a hale, hearty company, who are bound to live on the fat of the land, and sell only what they can't use themselves; who have, at least, time, taste, and means to array themselves in something better than a skimp cotton gown, and gladly make some concessions to hair-dressing; who take time to read something in addition to the bible, and avow a purpose to have a somewhat easier time than the farm team!

Personal habits of different members of the family greatly affect home life. Uncleanliness of body and impurity of mind are equally damaging. Dr. Holland says: "A young man is not fit for life until he is clean,—pure, clean, and healthy, body and soul, with no filth about his person or clothing; no tobacco in his mouth, no whisky in his stomach, no oath on his tongue, no snuff in his nose, and no thought in his heart which would send him sneaking into darkness from the presence of good women." We may condemn T. DeWitt Talmage's gymnastics and yet breathe a fervent amen to the following in one of his recent sermons:

"You all know what botanists describe as nicotiana. You know it as the inspiring, elevating, emparadising, nerve-shattering, dyspepsia-breeding, health-destroying tobacco. I shall not be offensively personal on this subject, for you nearly all use it. You say that God made it, and it is good. Yes; it is good to kill moths, to kill ticks on sheep and lice on cows; to strangle all kinds of vermin, to fumigate pestiferous places. You say God created it for some particular use. Yes; so he did henbane, and nux vomica, and copperas, and belladonna, and all those poisons. You say men live to be old who use it. Yes; in the sense that the man lasted well who was pickled. Smokers are turned into smoked livers. It creates unnatural thirst. The way that leads down to a drunkard's grave and a drunkard's hell is strewn thick with tobacco leaves. That man is not thoroughly converted who has not only got his heart clear but his mouth clean. Let those men who smoke go to the horse shed. I can name three eminent clergymen who died of cancer in the mouth, an evil caused by their tobacco. There has been many a clergyman whose tombstone was all covered up with eulogy who ought to have had an inscription, 'Killed by too much cavendish.' Some smoke until the room is blue, their spirits are blue, the world is blue. If you smoke cheap tobacco I want to tell you why it is cheap. It is a mixture of burdock, lamp-black, sawdust, colt's foot, plantain leaves, fuller's earth, lime, salt, and a little tobacco."

If it is true that "cleanliness is akin to godliness," we must visit the bath conscientiously, and sedulously cultivate clean finger nails, sleek boots, and change of linen. In any home where the husband and brothers go about smelling of the stall and pig sty, and the untidy wife and daughters appear habitually in shabby attire, with hair flying, you may expect to hear snapping, snarling, scolding, and find sullenness, petulance, and selfishness. Home is made the rag-bag of all ill humors, caprices, and wretched moods. For strangers, a chair may be shoved over the rent in the carpet, a tidy flung on the ragged edge of the cushion, a book dropped on the ink-stained table-spread, and the frouzy head brushed; sullenness may be wreathed with smiles, and shriveled old autumn may bloom instantly into rosy May;—but home is not for strangers. Many homes are full of love and sunshine for visitors, and all gloom and ugliness for the ones for whom they exist. A little decoration of rooms, and a little personal decoration on the part of mothers, wives, and daughters, will do much to make home agreeable and attractive. A pleasant word or two, on their part, when the tired, overworked men come home, often eats away the raw edge of trouble and awakens a corresponding desire to be pleasant and respectful, which characteristics are always accompanied by affection. If cheerfulness and amiability are not cultivated, rudeness, roughness, and impatience will be followed by insolence; sweet temper will give way to anger and discord; the home circle is no longer attractive and is shunned.

"Neatness and tidiness is what makes the farm so attractive and cheery, so that children take on good habits as they grow up, so that they won't want to run into the cities and towns to work in shops as soon as they can find a job that seems at least cleaner. Young folks think a good deal of good looks. If you want your daughters to get good husbands, keep your home looking as if they inherited neatness from their fathers and mothers; and don't expect your boy will get a first-class wife to want to live on a slovenly farm."

Boys leave the farm to their own disadvantage and that of their country. While it is not desirable to make farmers against their will of boys who obviously have fitness for something else, it is important that they know the advantages of farming compared with other pursuits, and that they shall not be driven from the farm by unattractive homes and harsh treatment. Seed time and harvest never fail; banks and other commercial companies sometimes do. A discontented son of a Dutch farmer had voluntarily abandoned his paternal roof. His fond mother invoked the aid of a magistrate to recover her hopeful scion. "I don't understand vy Shon run avay; certainly he got everytings he vant mit uns to home. Me unt his fader done all ve could for him." "Well, now," says Blackstone, "has he any marks by which we could identify him?" "Vell, I should dink, you see, dat all de marks vot I made on him mit a bed schlat vile his fader was holdin him across de kitchen taple wasn't all fated out yet, not quvite."

How many homes are spoiled by worry! The habit of taking things at their worst is likely to stick to a person like a coat of tar, and is just about as comfortable and beautiful. Some persons live in a state of perpetual fret. The weather is always objectionable; the temperature is never satisfactory. They have too much to do, and are driven to death; or too little and have no resources. If they are sick, they know that they never shall get well; if they are well, they expect soon to be sick. Something is sure to disturb their sleep; their food is never quite to their taste; they have corns which everyone treads on, or a toothache which no one recognizes. Their daily work is either drudgery, which they hate, or so difficult and complex that they cannot execute it. To hear the prolonged recital of their petty woes one would think them the most persecuted of mortals, and when people shrink from the disagreeable character, their lack of sympathy adds another drop to the cup of trouble. Yet these people have no more real cause for repining than the rest of the world.

Of all bores, the worst is he who brings his pills, and plasters, and powders into the family room; who expects the world to stop and listen when he sneezes, and who thinks his rheumatism a national concern. How much better to keep one's trouble to himself! If a husband is not kind a wife frets; the home is not pleasant; friends are not cordial; corns ache and joints creak, and things seem to be going generally wrong; just bury your sorrow. The place for sad and disgusting things is under ground. A sad man, full of sorrow and grief, and dying for sympathy, poured his tales of woe into the ears of a tender-hearted druggist. "This will drive thoughts of sorrow and bitter recollection from your mind," said the tender-hearted vender of cures, and put him up a little dose of quinine and wormwood, and rhubarb and Epsom salts, and a dash of castor oil, and that man forgot his sorrows and couldn't think of any thing in the world except new schemes for getting the taste out of his mouth.

But even if *pater familias* is generous, jovial, genial; is willing to recognize woman as his equal, and all that poetry about man's being the oak and woman the ivy, as stale, flat, and untrue; never showing his teeth when he is asked for ten cents for hairpins or a new gum-ring for the new baby;—if the wife and mother is tidy, industrious, welcoming home tired workers with a smile full of sunbeams, and a table full of good victuals; able to make her toilet without decorations of oxydized spiders, crabs, tarantulas, horsehoes, crocodiles, bees, dragon-flies, garter-snakes, shrimps, snails, grasshoppers, graceful eels, and pale-eyed oysters;—if the younger ladies are well versed in farm-house economies; radiant in unconscious beauty, the result of no cosmetics; no eyes brightened by belladonna, nor cheeks reddened by rouge, nor neck and shoulders whitened by pearl powder, nor hands dipped in amandine; beauty not of puffs, patches, ready-made blushes and artificial lightening, but the roseate beauty of useful employment of a father's tenderness or a mother's love, and of intimate converse with nature, beauty unadorned adorned the most; if their happiness does not demand

> "Dentine, coaline, bandoline, vasoline,
> Grenadine, bombazine, cosmoline, gasoline;"

if they know chicken from turkey, and butter from oleomargarine; if they avoid onions, or after partaking of that wholesome, nutritious, but strongly flavored vegetable, seek for a time the solitude of their private apartments; if the boys are models of manliness, never grunting at mother or sisters, nor assuming superiority, nor getting mad if they aren't praised, nor being so mean as to fill the parlor wood-box with green black-ash wood Sunday night, nor telling your beaux what you've said about them, and always showing a profound reverence for petticoat government, and feminine intelligence,—with all these, home education, and a reasonable attention to the finer amenities, may make marvelous improvements in the quality of home.

Some of the most precious parts of education and development are not acquired from books. How do men acquire that practical wisdom called experience, or develop that shrewd, solid, practical faculty called common-sense? Not so much by books, academies, and the appliances of study, as by intercourse with others, and the training of everyday life; by the indirect culture and discipline of the street, store, market, church; the constant communication with the many-sided world; but especially, is this poured by home influences into the heart and intellect.

Mary A. Livermore in a recent address said: "The boy of to-day is not receiving the proper home culture. Children slip away from paternal care.

This is due to the rigorous, old-time home culture. Education must be inculcated by the mother. In Wales and England, the character of the mother is inquired for as a recommendation for the son. The average boy, noisy, impetuous, detesting home work, bankrupt in education, and a dodger of churches and other pious places, yet has a fathomless tenderness for his mother, but he wants no spectator. He is characterized by a passionate loyalty to whatever he espouses, and a high sense of honor to which appeal can safely be made in most cases. One thing in his teaching is imperative—moral purity. Let the mother inculcate this with loving care, putting aside false notions of modesty and all prudishness. Let us have done with the belief in the saying, "Wild oats must sometime be sowed." He who thus sows must inevitably reap a similar harvest. Every boy should be trained to respect womanhood. Nothing so much adorns manhood as his respect for woman. The boy should be trained in politeness. This has a commercial value. He makes his way in the world easier for a pleasing address. There is no reason why the boy of to-day should not be taught the ordinary rules of etiquette. Good manners are to a man what beauty is to a woman. But best of all, train boys in honor, in integrity, and trustworthiness. To sum it all up, train the boy into manliness, that standard of manliness that combines the strongest virtues with the gentlest weakness. Let him be like a hand of iron in a glove of velvet. There is nothing higher or nobler than this."

The conscientious mother will deem it a duty likewise so to train her girls, that they will be courteous, efficient, methodical, and industrious,—so that married or single, they shall be skillful, useful, unselfish women. And in most cases where girls do not develop into such women, the fault has been in their home training. We need in our homes more of that very precious old-time reverence toward men and women, that simple courtesy toward the fireside, the school-room, and the pulpit, which characterized our earlier New England families. We lack respect for manhood, and reverence for what is sacred. Our boys grow, too soon, to be young gentlemen, and our girls grow fearfully old frightfully soon. These evils can be remedied in only one way, and that is by wholesome home instruction. Society has now so much machinery that we are letting it do many of our personal duties. We commit our babies to nurses, when every chronic old maid, even Annie Dickinson, confesses that "The man or woman who has never loved, hugged, kissed, played with, listened to, told stories to, or thoroughly spanked a baby, has missed the cardinal joys of life." We have good schools. We pay well for them, and think our duty of educating the children is done when we commit them to the teacher. Books and magazines must do our talking. Sunday-schools are expected to relieve us of moral and religious instruction. Thus, one of the evils of modern society is the excessive reliance on outside machinery to do the work of home. Now, it ought to be a delight to parents to be in constant and active contact with the minds of children; to exert their talents in the domestic circle; to put their knowledge at the service of the family; to pronounce useful maxims, illustrate great truths, give wholesome advice, and inspire laudable ambitions. What opportunities for instruction the long, dark, cold, winter-nights bring to the farmer's family! While revellers dance to lively music, amid gay scenes, in brilliant halls, we may enjoy a dearer scene,—the cheerful home fireside, instructive books, studious children, and the society of those friends whom the heart and experience aknowledge to be true. Here intelligence, sobriety, thoughtfulness, and peaceableness may be acquired; and they can be acquired only at home and by study. Home instruction is the best of all instruction. All who have children have pupils. The winter evening is the chosen time to instruct them, while they are passing through the tender years of childhood and youth. Those who are learning school-tasks will be encouraged by the presence and aided by the superior knowledge of the parents. How much weariness and perplexity may be avoided by a little assistance and sympathy! Stern and stormy as they may seem, the winter evenings may well be called the friends of wisdom, the patrons of literature, the nurses of vigorous, patient, inquisitive, untiring intellect.

From the quality of home instruction will grow the language, conversation, and manners of domestic life. Very few children use their mother tongue correctly, and the fault is not in the text books of grammar they use nor of their instruction in school. For the general debility and awkwardness of the English used by children, the teacher may as well stop prescribing. A boy who successfully parsed a complicated sentence was heard to shout an hour later at the school-room door, "Him an' me's goin' afishin'; us boys haint got no more lessons to git till to-morrer." And when he was called in for correction, he persisted that "he didn't do nothin'."

The only successful treatment which can be given for this sort of speech must be in the general conversation at home. Mere knowledge of rules will never make a child speak correctly, unless the knowledge imparted is made familiar by constant practice. So if parents do not teach good language in chaste conversation on topics of interest, it will never be taught.

In connection with the subject of bad English, another and most inexcusable habit may be mentioned, the use of slang words and phrases. The following is reported as dropping from the ruddy lips of two stylish young ladies. One tells how she brought her lover to the point: "Nobby, you've been foolin' 'round this claim for mighty near a year, an' hev never yet shot off your mouth on the marryin' biz. I've cottoned to you on the square clear through, an' hev stood off every other galloot that has tried to chip in; and now I want you to cotton down to business or leave the ranch. Ef you're on the marry, an' want a pard that'll stick rite to ye till ye pass in your checks an' the good Lord calls ye over the range, just squeal, an' we'll hitch; but ef that ain't your game, draw out an' give some other fellow a show for his pile. Now sing yer song or skip out." Then the other shies up and modestly remarks: "If Jen Smith gits there, she's got to be A No 1, toe the mark, and be less highfalutin. You bet your head on that; she can talk like a book and spin street yarn, but I tell you as long as she plays so mighty fine, and sticks up her nose at common folks, she can't come to tea. Maybe she's handsome, but she can't come in. She might as well cave in and absquatulate, for she can't put it through, any way she can fix it." And the other genteelly replies: "Come now, you 're mashed. If Jim don't come up to the scratch, let him slide, and catch on somewhere else. If he's got a sneakin' notion that he's such a regular brick, and he can cotton up to everybody and feed taffy, by the jumping Moses, I'd just tell him to dry up and cut stick. I'd give him particular fits and make him evaporate. If I didn't I'd titter to ejaculate. Gracious!" It may be added that these young ladies wore ulsters and Derby hats, had their hands in their pockets and walked with a manly stride.

People must talk, and conversation will be on topics within common knowledge and of common interest. In homes lacking that culture which furnishes profitable topics and limitations, gossip is one of the worst vices. What neighbors say, what they do, wear, eat; their society, business, personal appearance, loves, and religion, and specially their matrimonial prospects—all this tittle-tattle, sweetened by approval, or embittered by spite, is retailed at the family fireside. The seeds of anger, animosity, and social discord are thus sown; families are crushed; neighbors are made irreconcilably hostile; and untold wretchedness is caused by this low, foul, and frivolous business. Gossip is founded either in malice or imbecility. A chronic gossiper is incurable, but young people may be shown the dangers and evil of the habit, and thus be reclaimed by proper instruction and culture—a change of pasture and of heart. Conversation boasts of a sacred charter, "It is not good for man to be alone." "As iron sharpeneth iron, so a man sharpeneth the countenance of his friend;" but he needn't sharpen his tongue so that they may together pick all the meat off other people's bones.

Of all places in the world, home is the place to cultivate good manners. We may be rich in solid gold, but be poor indeed in the small change of politeness. That "fine words butter no parsnips," is a mistake. Fine words and fine manners butter all kinds of parsnips; and there are many people whose parsnips are buttered in no other way. Burke aptly says: "Manners are of more importance than laws; for upon these, in a great measure, the laws depend. The laws touch us but here and there, now and then. Manners are what vex or soothe, corrupt or purify, exalt or debase, barbarize or refine us, by a constant, uniform, insensible operation, like that of the air we breathe in. They give their whole form and color to our lives. According to their quality they aid in morals, they supply laws, or they totally destroy them."

In most books of etiquette writers begin and end away from home as if the laws of behavior and codes of manners were of value only at the neighbors, and had no value or application at home. Now, as a matter of fact, may not home happiness be greatly increased by a nice attention to manners, or the "minor morals" of life? The basis of true courtesy is respect. If you can teach the young fellow who grunts over the newspaper at his mother and sister a thorough respect for humanity, you have planted the true seeds of good manners; otherwise you will veneer in vain with the forms of politeness. "Give a boy address and accomplishments," says Emerson, "and you give him the mastery of mansions, palaces, and fortunes wherever he goes. He has not the trouble of earning them or owning them; they solicit him to enter and possess;" while coarseness and gruffness lock doors and close hearts against him. Politeness may be called benevolence in small things. The true gentleman is one whose aims are generous; whose trust is constant; whose word is never broken; whose honor is never stained; who is brave, gentle, honest, and wise; who wrongs no one by word or deed, and who devotes and embellishes life by nobility of thought, depth of feeling, and grace of manner. "The taste for beauty and relish for what is decent, just, and amiable perfects the character of a gentleman." The true lady is his counterpart; pure, refined, generous, sweet-tempered, gentle of speech, truthful to her heart's core; instant in well-doing, shunning the very shadow of evil; of tempered enthusiasm, exquisite innocence, frank gayety, and boundless love,—to such grace and fine manners must come as the admirable outcome of noble, divine qualities of mind and heart.

We *live* at home, so that all are interested in making home attractive and enjoyable. Good manners may be defined as the art of making those we live with happy. Courtesy is a thing for "consumption on the premises," and is only an expression of generous temper, refined taste, and cultivated mind. Says a Lounger in Society: "It is the duty of every member of a family, to do all he can to promote the happiness of the other members. It is necessary, therefore, to bear and forbear; to make mutual concessions; to keep down selfishness; to cultivate a love of justice and honor; to get rid of our petty likes and dislikes; to conquer and control our temper. Much may be done by a nice attention to the requirements of etiquette, by an observance of those laws which govern the decencies and proprieties of life. There is no reason why a husband should not treat his wife with exquisite politeness; why a wife should not remember that her husband has a claim to be treated like a gentleman; why the finest manners should not be observed by brothers and sisters." This mutual courtesy, inspired by mutual love, would purify the atmosphere of home, and invest with a new dignity our domestic relations. Let us make etiquette a matter of household concern, seeing it touches us as nearly as the price per pound of soap, salt, or sugar. Why are we to throw off our politeness, like a cloak, when we cross our own household? Why should not our mother or sisters claim from us those graceful observances which we make it a point of honor to vouchsafe to strangers? The man who stands with his hat on in the presence of his mother and sister manifests thereby such a want of apprehension of the requirements of filial and fraternal reverence and affection—of the rudiments of true domestic loyalty—as, if circumstances do not combine to correct him, will in the long-run render him fit for treason, stratagems, and spoils; he sets at naught feelings and principles which would interpose one of the most important barriers between himself and crime. It would not be surprising if such a man were to finish his career in the dock or the hulks; he lacks the true nobility and elevation of sentiment without which he will not, and he cannot, come to good.

The happiness of home will be promoted by a due attention to recreation. The heads of a family should see that its younger members are provided with wholesome amusements; and the cultivation of music or drawing, the reading aloud of good books, the introduction of a game, will help wonderfully to facilitate the smooth passage of the hours. Man cannot live by bread alone; his mind must be cheered, his heart lightened, by the supply of refining pastimes. *Dulce est desipere in loco;* that is, in the bosom of one's family, for nowhere else will enjoyment be purer or more genuine. The gloom which lies about some households is distressing; the father never smooths the furrows of his brow, the mother's countenance never loses its shadow, the daughter's lips never brighten into a smile, the son's voice never breaks out into hearty laughter. They keep their weariness and sadness for home consumption.

Music is a good commodity to have in the house. Life is not too short nor time too precious, to spend an hour a day in sawing the squeaking fiddle, blowing the melancholy flute, banging the piano, puffing away at the droning trombone, or screeching for dear life on difficult vocalizations. From all this clatter and bang will come a moral harmony as well as a harmony of sounds,—a skillful blending of voices and instruments, and sweet spiritual concord.

A stranger visiting Boston said he could almost see the fine essence of inspiration steaming upward as a visible vapor from the scalps of the cultured Bostonians; that when a Boston policeman hits a malefactor over the head with his truncheon, the dying man observes, in one of the deceased languages: "Peeler, morituri te salutamus," and the peeler not only understands him, but hits him another rap if he makes a false quantity. While there is satire in this grotesque imagery, we know there is a widespread atmosphere of refinement in New England life not found farther west. The one leading quality in this inherited excellence lies in home life, in the spirit of reading and independent thinking, the reverence for learning, and the learned which pervades almost every home there. A good book finds entrance and welcome in the New England home as nowhere else. It is respected by the father, reverenced by the mother, and read by the children. It may be a poem, or the last report of the Department of Agriculture; it may be a literary magazine or the "Farmer's Almanac," it finds readers in the family, whether appreciative or merely ambitious—but readers anyhow. The New England boy is taught to feel that he has only to pack his books in his bundle and start on the road, which leads to a foreign mission.

We live in a mixed world. Good and evil seem to be inseparable.

> "Hearts, like apples, are hard and sour
> Till crushed by pain's relentless power."

There is no true home where there has not been sorrow, struggle, self-sacrifice, renunciation, courage, heroism. And if all the members of the family have been made perfect through suffering or otherwise, the farmer's "Eden" may be disturbed by outsiders. (Satan was an outsider till the first apples were ripe and gathered). Your young roosters may fight with the neighbor's and come out of the conflict minus cockeye and comb; your pullets may eat the strawberries and scratch up the peas; your cats may kill the chickens; your puppies may worry the kittens and suck the eggs; your pigs may break out, root up the potatoes, and spoil the cabbage; your calves may butt the children, nibble the shrubbery, and curtail the young horses; the hired girl may water the coffee, steal cookies and preserves for the hired man, burn the biscuit, and scald the pup. A little comfort will be drawn, however, from the general law of compensation; the roosters will be knocked into pie; the pullets will be cooped up to hard labor in solitary confinement; the pigs will go to the pork barrel and lard crock; the calves will go to the butchers—your Sunday feet will stretch the skin of the calves, and their juicy joints will stretch your Sunday stomach; the cats will go courting and get shot; the pup will be drowned, and the hired girl get married. Let no mournful lamentations arise over microscopic ills. Cheerfulness knits up the ravelled sleeve of care, and extracts sunbeams from cucumbers.

To sum up: Home is rendered enjoyable by good health, good sleep, good living, comfortable and attractive dwellings, pleasant home relations, and the genuine gentility of habits and manners coming from cultured minds and loving hearts. The true home is the abode of dignity, propriety, beauty, grace, love, genial fellowship, and happy associations.

And now we close as began—the heart of our country lies in her homes. The test of national institutions is the character of the people. The world—wealth, art, knowledge, power—is enjoyable just so far as we make it tributary to our home life. Side by side stand the altar of Liberty and the altar of Home. If a pure religion has kindled their flames, let us never forget that it is from these flames, burning heavenward with a steady strength of warmth and lustre, that Providence brings the fiery swords which arm us for our highest achievements and most glorious victories.

HOW SHALL THE BOYS BE KEPT ON THE FARM?

E. J. MAC EWAN.

[Spoken at Armada, Farmington, Jeddo, and Trent Institutes.]

To the professor whose regular work does not demand that he shall go

"Poking his nose into this thing or that,
At a gnat, or a bat, or a cat, or a rat,
Or great ugly things, all legs and wings,
With nasty long tails armed with nasty long stings.
Or pore by the hour o'er a weed or a flower,
Or the slugs that come crawling out after a shower,"

the selection of a suitable subject and the preparation or the process of turning sauerkraut into cheese or cornstalks into cookies, of a lecture for the annual institutes seems like the oppression of a dreadful incubus; or, as Dickens puts it, "an overwhelming pen-and-ink-u-bus." However, from the bombardment of interrogatives by old men and young men, old women and young women, wise and otherwise, directed against a presumptuous young writer on "Home Life," at some of the last year's institutes, it is evident that a question of general and never failing interest to the farmers, born social creatures, with an abounding love for home and family is, "How shall we k ep our young people on the farm?" And although I have no boy to keep on a farm, and no farm to keep a boy on, yet, in the light of extended observation among farmers and the experience of a few years of pioneer farm life, I shall not hesitate to discuss a few points in answer to this question.

In discussing this question, it may be assumed that if the boys can be kept on the farm, the girls will stay there too; and if the girls stay on the farm husbandry will present attractions unequaled by any other occupation. If any nice young man from Detroit or Muskegon, with a blue neck-tie, celluloid collar, and horse-shoe cuff-buttons, tries to hold your daughter's hand on the balcony, she'll tell the dandy jack, clothed in a gilt vest-chain and some credulous tailor's coat, that her regular beau, who wears linen collars sewed on his shirt, has promised "to save his money, and buy a farm, and take her for his wife;" and she's promised to him for the next waltz, and that any male biped who parts his hair in the middle of his marble cocoanut, blacks his moustache, and is in debt to his washerwoman, never was ordained by Providence to board with her father and mother at the farm-house in Armada.

Oh, I am only a farmer's girl,
  And John is only a farmer's lad,
But I'd rather be his in his humble life
Than be a "lady" as a Senator's wife,
  With a restless heart and sad!

And your son, so long as your neighbor's sensible daughters are content to stay on the farm, and he knows that life is made up of use, work, service, will never run away from the farm and run the risk of pulling in double harness with the compound double-and-twisted starched, comical, artificial-touch-me-not curiosity, that doesn't know a wash-tub from a butter-bowl, mistakes the bread tray for a baby's cradle, and sews licorice lozenges on her brother's coat for buttons,—a deformed, half-breathing ornament, found in town, and by courtesy called a young woman.

It will be sufficient, then, to discuss the question, "How shall the *boys* be kept on the farm?" And, of course, what is needed is not abuse of those in fault, but honest, intelligent criticism; not cant, but candor; not the blowing of beautiful bubbles, but sober, earnest, careful, critical, thoughtful examination. It is not to be lamented that all the boys do not stay on the farm. It is not to be deplored that all the graduates of the agricultural colleges do not go back to the farm where they were reared. Many of them ought to become manufacturers, merchants, lawyers, journalists, doctors, and ministers, carrying into the town the good sense and thrift that purifies while it strengthens; and into the rural districts, with professional or mercantile business, the inspiration to active social intercourse that overcomes reserve. Each year ought to lessen the difference between the isolated, unsocial life of the country and the culture and refinement of the city; but we want the brightest, most active, enterprising, and vigorous boys to stay on the farm; or, having completed a good scientific education, to return to the farm and help develop its best possibilities.

The principle which prompts us to better our condition, usually a calm and dispassionate desire, is born into the world with us, and abides with us till we lie in the grave. The boys on the farm, as it too often is, see that "in the sweat of his brow" their father earns his bread. The frosts bite, the winds wither, the sun scorches, the floods drown, the insects devour, and mildews mysteriously blight. Long years of patient, sordid drudgery seem to be rewarded with merely a scant competence for old age. The boys naturally long for a pleasanter, more genteel, and more lucrative employment, one which is not sordid; one in which the person and clothes may be kept clean; one in which the form may be kept upright as nature intended, and the hands white, soft, and supple, not hard, cramped, callous, and misshapen; one in which they may be brought into nearer relation to others socially, may use brain more and muscle less, and may feel a closer resemblance to the ideal human being, than to a machine. Ignorant of the world and its ways, and of the grand possibilities of life and living, of service, profit, and enjoyment on the farm, they believe any employment,—profession, business, trade, agency, lcerkship,—anything not demanding manual labor, preferable to the toil and drudgery and meager compensation of the farmer's calling. And so one goes to the town high-school, is pitchforked through an elementary course of Latin and Greek, "drilled in proparoxytones and properispomena, and in logaœdic dactylic duplex dupliciter trochaic acatalectics;" attends medical lectures, sees a pauper corpse or two cut to pieces, crams for examination, steals a diploma, and "with all his blushing honors thick upon his vacant head," begins to kill people scientifically, stuffing stomachs of which he knows nothing, with drugs of which he knows still less. "A charge to keep I have," is a doctor's song. Another allows the *law* to perpetrate a fraud on the corn-field and potato patch, and snatch him away to a short term of reading, then a long term of seedy starvation, when he enlists in the greedy army of long-legged, eager-eyed, nervous beggars, seeking public office or government position, and "in the sea of upturned faces, distends his hungry jaws to catch a sop from the public table or a scrap from the public trough." Another, fired with philanthropy, and stupefied with theology, thrusts his head through the clerical collar, turns his brain into a gland to secrete and discharge every week two sermons, and no end of cant, and all his life looks back with envy and chagrin on the free, healthful, independent life of the farmer. Another becomes an editor, a walking bundle of items and talking squibs, advertising railroads one hundred dollars' worth, and riding free twenty-five cents worth; puffing concerts and lectures fifty dollars' worth and receiving a fifteen cent complimentary ticket. Another becomes a merchant, and like the rest of the gas works, is a fixture in the store. Another turns school-master, to get rich by the blessing of God, and flogging other people's children. Now, what are the real reasons that these boys have so little relish for the safe, solid, honorable business of their fathers? And when they launch out for themselves, whether to earn bread and meat and clothing and shelter, or having these in abundance, to make the best use of their lives to develop to the uttermost the talents given them. To secure the noble consciousness of winning a name and place among their fellows, why do they so eagerly rush away from the farm to engage in some profession, business, or trade in the town? And what is the remedy for this widespread and deplorable evil?

One common source of discontent among the young people is the farmer's too common grumbling, disparagement of his calling. In presence of his boys, many a farmer decries it with an apostle's zeal and a martyr's devotion. He has no appreciation of the advantages of farm life (nor for that matter, in too many cases, for any life); it is uneventful and prosy. Everything is unpropitious. What he does not have he wants; what he does possess is unsatisfactory and full of discounts; rains are too wet and untimely; seasons too backward or forward. He envies the stockholder, for he (the farmer) can't get rich watering his stock once. He envies the storekeepers and tradesmen whom his fancy puts in easy chairs, gives plenty of money, almost nothing to do, and all the luxuries of life to enjoy. He threatens to sell his farm and go into the grocery business, keep a boarding house, solicit insurance, or peddle books. He considers all compliments to his thrift, usefulness, and independence as pure taffy. Ignorant of the risks, annoyances, anxieties and disappointments or downright failures of other kinds of business, he allows the expression of his envy and discontent to awaken in the breasts of his boys an unconquerable aversion to his occupation.

> " It was down in Indianner that he sparked and married Hanner,
>   Which is probably the reason he's a story to relate;
> For the world was all agin him, and there wa'nt no good luck in him,
>   And his toes grew sore a kickin' 'gin the bony shins of fate.
>
> " On the farm somehow or other storms keep chasing one another,
>   Till they trample down his harvest and they mildew all his hay;
> Still he's time enough to gather all his crops in decent weather,
>   If he didn't run for office which (the office) runs away,
>   Leavin' Hanner in a manner
>   To hold aloft the family banner."

It would be folly to expect farmers or any other people to be perfectly contented in their lot; to be like the unassuming cabbage growing up to maturity amid the showers and sunshine of spring and summer, unmindful of past or future. No contented man, stolidly sitting on the rung of life's ladder where the accident of birth has placed him, looking upward and downward with equal indifference, thinking he has all he wants but willing to accept any good chance winds may bring him, provided its acceptance requires no effort, ever did or ever will make his mark in the world; but there is a very bad discontent as well as a very good one. Discontent, growing from a desire for greater attainment or usefulness, or the worthy achievement of honorable name and position, is undoubtedly of divine origin; but discontent springing up in a selfish soul, failing to conceive the value of its own place, disgusted with its lot, envious of the success, position, or possessions of others, is an unmixed evil.

The ideal of life here and hereafter is pleasure. High it may be, or it may be low; but it is still pleasure, enjoyment, happiness. Next below this but accessory to it are comfort, and a life free from harass and grind. Men seek office, public station, fame, wealth, mental acquisition, because they think there is greater happiness on what are called the upper steps of society than on theirs. And here is their great mistake. They forget that want keeps pace with wealth; that responsibility goes hand in hand with position; that posts of honor are always posts of danger; that office means burdensome duty. If we were only willing to see it, happiness is very evenly distributed. The day laborer loves his wife and children just as well as the Lord Chancellor loves his. Food is as sweet to the plowman as to the prince; if one has the daintier dish the other has the keener appetite. The sun, the air, the breeze, the rain, the stars are for all alike. Sleep does not come at the bidding of power. Health comes and abides with him who treats it best; and President Arthur and Queen Victoria might whistle themselves blind before they could coax away a farmer's dog. If any one really wants a thing he must be willing to pay the price for it. If farmers want to cure this itching of their boys for town life they must deny themselves the luxury of whining, and grumbling, and moaning, and driveling about the hardships to be endured on the farm. They must brighten up and create in themselves first, and then in the boys, a genuine love of the farm. Make farm life pleasant; show the boys that it is respectable; prove to them that it is profitable, and they won't leave the farm. The boy who has a good team and good tools; who can turn a perfect furrow and draw a straight line across his corn ground; get in his crops just at the right time; have all crop and no weeds; raise a little more to the acre than his fellows; who can see the beauty as well as profit of fine stock; of caring for, properly sheltering, keeping in good condition and improving breeds,—this is the boy who loves farming, and who will stick to it. The big-boned, big-hearted, big-brained farmers of Michigan are able to hold their own and blow their horns as loud as anybody. They are, without doubt, the best people in the world; they love their country, their kindred, their neighbors, and their homes; but they have been so long content to let some one else blow their horns, or they have blown so long into the big end of their "tooters" that their own praise of their calling seems always to come from the little end of the horn. "He that bloweth not his own horn, for him shall no horn be blown."

The natural isolation of the farm-house makes a pleasant home-life indispensable, and many a boy has been driven from the farm by having a "hard time" at home. The heart of the father may be all right, and his intention sound, and yet he may invariably seem to the boys to have a nature so hard that if you should bore into his back with a gimlet, sawdust would rattle out. Of course blandness and geniality of manner is not always an indication of good behavior or intention, and is not enough, without the right feeling at heart. The old cow that has visited my garden nights for three summers, eaten all the sweet corn, trampled down the peas, and reposed on lettuce and asparagus beds, and then contentedly chewed her cud and whisked her tail at me in the morning, is the blandest and most genial creature imaginable. The mother may have a warm place in her heart for her boy, yet wear an air so icy that he takes cold every time he looks at her. Fire is a good thing to have in the house, but it should be in the stove cooking food, or warming rooms, and not in a mother's temper, roasting the boys. "The old barn,—lofty haymows piled to the roof, with its garnered treasures of fragrant, new-mown hay;

the wistful whinny of the old horse; the perfumed breath of the meek-eyed cows; the oxen reaching their upturned tongues for the tempting feast 'so near, and yet so far;' the parti-colored hens, the ducks, and the geese, with rattling croak and husky hiss, and quick, vibrating tail; the festive pig, and innocent, sportive lamb, whose querulous voices come floating on the breeze; the pile of husks from whose bleached and rustling sheaths are picked the little ravelings of brown silk for mimic cigarettes,"—all this is very poetical. But when, in hot weather, the boys have to sleep in the loft over the stables, wearing the same clothes in which they have tugged and sweat all day in the hay-field or harvest, it is not only not poetical, but it's mighty uncomfortable. They impeach Milton in one passage. The mind is *not* its own place; and in itself can *not* make a heaven of hell; but they are with him in another:—"When night darkens the streets then wander forth the sons, * * * * And execute their airy purposes." Or, if the boys are huddled into the garret or any ugly, uncomfortable, ill-ventilated, meagerly furnished cubby-hole, with no carpet, no paper, no curtains, no decorations, no elbow-room, no place for a boy's hobbies; while the girls have a pretty, sunny chamber in the front part of the house, furnished prettily—carpets, rugs, window-drapery, book-racks, flowers,—

> " The way into their parlor is up a winding stair;
> Gay Japanese umbrellas are fastened here and there,
> And fans and peacock feathers hang with a careless air,"—

and may be jugs, jars, vases, urns, shields, cracked china, a chaos of colors, knicknacks, and all sorts of fantastic foolishness adorn the room, can the boys be contented? Boys like a place of their own in the house, and they like to be recognized as a part of the institution. A boy is something better than a featherless biped, or a forked radish with a curiously carved head.

If, in the absence of company, mother and sisters sit down to dinner or tea with soiled calico gowns, clamped at the throat with a clothespin, no bows, no ribbons, and hair as frowsy as the make up of a political primary, why should not the boys take it as a personal affront? Or if there is such stern discipline in the arrangement of the house, such precision, rigidity, angularity, mathematical exactness, that an open book, a chair awry, a spot on the paint, or window, is considered a capital offense, why shouldn't a healthy boy think such a room dead and full of rottenness,—a place for company, surface life talk, and lies? A well ordered home, and a happy one, is the great blessing of earth; but it mustn't be too awfully nice, so that those who need it most must live in the woodshed or barn.

Boys are likely to be particular about food and notional about clothing. Let a farmer tell them as often and emphatically as he pleases, that one may live on fried pork, soggy potatoes, saleratus biscuit, and dried apples, and if he only breathes the pure air of the country, he will have healthier blood, finer skin, and brighter eyes, than the consumer of the choicest meats and most luscious fruits, who breathes furnace heated air, and if they know anything, as they usually do, they will ask for good living and good air too, and they are right; and the boy is right not to be satisfied with stogy boots, sackcloth trowsers, denims shirts, a chip hat, and a cheap Jew-store ready-made Sunday suit, bought when it is two years too large for him, and worn till its three years too small. The country boy does not want to look outlandish in a suit of clothes made over from some his father wore years ago—pantaloons that bag at the knees and seat of war, only one suspender, and his arms and face and neck, and a strip a yard long down his spinal column where his shirt opens, burned as brown as a Thanksgiving turkey, by the summer sun. For these, and the innumerable petty hardships of uncomfortable home life, there is for the farm boy only the consolation found by a wise old lady in the eighth verse of the fourteenth chapter of Nicodemus, "Grin and bear it," or leave the farm; and there is this item against evolution here, that the boy doesn't naturally grin.

Dislike of labor, and the hard practical things of life, before the habit of working has become a second nature, drives many boys from the farm. There is nothing ennobling in the drudgery of labor as seen by the average farmer boy. The grave talk about the dignity of labor is mainly gas. The whole movement of civilization is to force the inorganic world to do the work which men have had to do. Everybody looks forward to the time when machinnery will do about all that can be done. Most of the heavy work may now be done with wind, steam, and horses. Machines already plant, hoe, and shell the corn, dig the potatoes, mow the grass, ted, rake, load, and unload the hay, sow, reap, bind, and thresh the grain; and no telling how soon we may run breaking-up teams by telephone, split rails by electricity, and shear sheep by steam. Whatever has been the case in the past—and now in frontier districts,—when timber was to be cleared, stumps pulled, mortgages lifted, buildings erected; when it was a long way to market, and produce was paid for in trade; when all implements were clumsily hacked out at home, or hammered out by the nearest blacksmith, there need be less drudgery now, on the improved farm, and the need is growing less year by year. Taking the years together, the farmer need work fewer hours a day than the mechanic, the artisan, or other laborers. The average lawyer and doctor in good practice work more hours a day than the farmer is obliged to; and the grocer, editor, and bookkeeper have less time to spend with their families than the farmer who envies them their easy life, may have. Providence never designed man to be a mere mill-horse, treading forever the same dull, unvarying round, all for grist upon grist, till the steady, unceasing grind ends in stupidity and blindness. Yet many farmers still persist in getting up, and routing out their families at four o'clock in the morning the year round, and working twelve or fifteen hours a day,—with a rest of fifteen minutes morning, noon, and night, for feeding, bolting meals with no more of the dignity and amenities of life at the table than may be found at the manger during cattle-foddering—and this kept up six days a week, fifty-two weeks a year, except rainy days, when they work in the garden or go fishing, and Sundays, when they salt the cattle in the forenoon, and in the afternoon sleep at home or in the meeting-house, through a hard routine of ritual servitude, changing the work-day garments of the slave only for the Sunday sackcloth of the sinner, seeing the blue heavens only as the roof of a work-house or the dome of a sepulchre. And the boys have to work—don't forget this. The idea of labor is instilled into their minds. It is rammed in tight, and rammed loose again; it is rammed in with illustrations, and rammed in with demonstrations; it is rammed in in every conceivable way, with every imaginable kind of ramrod. Home, which ought to be a paradise, is a penitentiary. If a boy isn't too tired to play ball, skate, slide down hill, or go to spelling-school, he isn't too tired to split wood, churn, feed the pigs, tend the baby, or run on errands. All his animal spirits are conscientiously directed in channels of industry and usefulness. and he never has what he calls "a good time." In some farmers' families yet the gad is a constant quantity. There is a well-grounded belief that a boy's memory is strengthened, his wits sharpened, and his conscience quickened by frequent sproutings. If three boys are found together out of school, all must be walloped or somebody has an uneasy conscience, for mischief is brewing. Boys must be sober, frosty, doleful; never caper, dance, joke, tell stories, play games, sing songs—except penitential psalms—must never be caught at a circus, theatre, concert, or dance, it's so wicked, and costs a little money. If the farmer father would only think, while he is grumbling at the boys because they don't like work, nor books, nor home, nor his company, that their great, crying, everlasting need is wholesome rest and healthy recreation; freedem from the shackles of drudgery; opportunity to amuse themselves; if he would only make the distinction between getting a living, a process familiar to all of us, and living itself,—"engaging in and enjoying intellectual activity outside of and above that which provides for bodily wants; acquiring and enjoying knowledge, and the power which is born of it; giving free exercise to social sympathy, in a pure intercourse with young and old; having a sweet satisfaction in home, so that it shall be the one bright spot on earth, and never left without a sense of sacrifice; delighting in some things which rise above the bare utilities of life, into the realm of the beautiful, and cultivating the arts which make this realm attractive; finding happiness in the activity of the moral and religious nature in worship and in ministry,"*—all of which is necessary to true living,—then fewer strong-limbed boys would leave the plow and hoe for the yard-stick and scissors, to save their muscles from labor, or prefer to simper and smirk behind a counter, to doing a man's work behind the plow; and fewer would be found among the well-dressed slaves to capital, "the shirks of the world, the would-be 'Peter Funks,' beggars, thieves, suckers, swindlers, supernumeraries, and sinners generally."* "There is nothing better for a man than that he should eat and drink, and that he should make his soul enjoy good in his labor. This also I saw, that it was from the hand of God."

False notions regarding the use of education, and the application of knowledge, send many of the brightest boys away from the farm. Beecher says, discussing educated farmers: "Lawyers, physicians, clergymen, literary men, make the discipline of their intellect a constant study. They read, think, and write more than the farmers. The difference between the educated and the uneducated portions of society is a real difference, and the only way to get over it is to rear up a generation of well educated, reading, thinking farmers. Their skill and industry is felt, and just as soon as their heads are felt as their hands are, they will be brought to the top." Many of the best farmers are men of great natural shrewdness, who have had no chance of learning. They feel the loss, and are bound to give their children the best education they can. Farmers' sons constitute three-fifths of the educated class; but the trouble is they are not educated as farmers. When they begin to study they leave the farm. They do not expect to return to it. The idea of sending a boy to school, the academy or college, and then letting him go back to farming, is considered a mere waste of time and money. If a boy has an education, he is expected to be a lawyer, doctor, or preacher. It is honestly believed that a farmer does not need brains or education. This is a very old notion. Bocaccio, writing five hundred years ago, of people fifteen hundred years before his time, says: "Now Cymon was a fool, a man of proper person, and the governor of Cyprus's son, but a very ass; so much so that he was sent to a farm house in the country to learn how to till the soil." While scholarship is not power nor ability to cram, proficiency, the farmer who contentedly tills his fields by the sweat of his brow, letting what lies back of the brow go fallow, will not get on. There must be good brain as well as good muscle. The times are teeming with new ideas, and the farmer must be bounced out of the ruts and strike his head against some of these new notions. There is nothing in algebra, or botany, or chemistry, or philosophy, or literature, to unfit a boy for the farm; but, during the boy's school life, there is much in the spirit inculcated at home by parents, and at school by teachers and visitors, to create discontent and excite insubordination. Ambitious selections are collected for reading books; ambitious declamations are spouted. Old fools—played-out pedagogues and fogy parsons—visit the schools, and always "make some remarks." They tell the boys to "aim high," to "shoot at the sun," to "hitch their wagon to a star," to "look way up, and may be they'll catch a school ma'am."

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*Holland.

They quote Longfellow's

> "Lives of great men all remind us
> We can make our lives sublime,"

which is very musical and very false. A few great men have made their memories sublime; but we can't all do it; for the offices of life are mainly humble, requiring humble powers, and giving but humble rewards. The backwoodsman, the tailor, the canal driver who have become presidents; the fur trader who became a mighty millionaire (and a mighty mean one); the country school-master, who became a prince among merchants; the few, who by enterprise, self-assertion, self-culture, have raised themselves from obscurity to place and power,—these the school-master and antiquated visitor keep before boys as shining examples. They tell a little truth and a good deal of falsehood to rouse unlettered ambition. They stimulate the boys not to rise in their own sphere, but to rise in the world irrespective of ability, tastes, or chances of success and usefulness. Barefaced lies are written in copy books; "Where there's a will, there's a way," as if Sammy Tilden's will could make him President, or Jay Hubbell's could have sent him back to Congress, political assessments and all; "Labor conquers all things," as if the veriest blockhead could write Shakespeare's plays, manipulate Vanderbilt's railroads, or draw Remenyi's fiddle bow by main strength. To become great lawyers, doctors, ministers, scholars, statesmen, capitalists (they are never told they may become great farmers), boys need only to labor, and will irrespective of natural adaptation or the demand for such men. Under spurs like these, the deluded victims of false ideas rush away from the farms to the towns

> "Where bang, whang, whang, goes the drum,
> And tootle de tootle the fife,"

and the densest crowd marching in time follows the music.

Said George William Curtis in a recent oration: "Take from the country at this moment the educated power which is contemned as romantic and sentimental, and you would take from the army its general, from the ship its compass, from national action its moral mainspring. It is not the demagogue and the shouting rabble, it is the people heeding the word of the thinker and the lesson of experience, which secures the welfare of the American Republic and enlarges human liberty. If American scholarship does not carry the election to-day, it determines the policy of to-morrow."

If such is the leadership of educated thought in civil affairs, can it be less on the condition of the husbandman and the progress of agriculture? But our boys, who are to be the leaders, must be educated in their calling, not above and away from it. They must see that it requires more thought to manage a farm profitably than to win a game of checkers; they must be taught to estimate at its real value, the farmer's calling, and see the vast field it presents for thought, culture, mental activity, and enjoyment; its demand above all other professions for varied and extended knowledge. There is no reason why men of the very highest education should not go to the farm for a living, if they have common sense to begin with. The editor of the Christian Union would have the farmer a perfect man, combining all the knowledge, culture, and brain force of a dozen professional men or artisans. "The educated farmer must be able to keep pace with the advance of modern science, and to discern wherein its development may be brought to his aid. He should be a better chemist than his doctor or his druggist, a better botanist than either, and should be acquainted with geology, mineralogy, entomology, and somewhat with meteorology. He should be as good a business man as his grocer or his banker; especially, he must know how to buy and to sell. He must understand the physical powers, know the value and strength of materials, and be a pretty good mechanic, if not an engineer. He should be able to do plain surveying and leveling, and to manage a microscope. The usefulness of Latin, elementary at least, as an aid to the study of natural history, is well appreciated; and America is still so slow in scientific matters that the ability to read French and German add much to one's capacity in this line of study. A farmer needs as accurate knowledge of anatomy and physiology as a physician, though it be in a different and wider field; he needs to be something of a lawyer to know what trees he may cut, and when he may shoot a woodchuck or take a trout on his own farm; and he needs a fair share of his minister's theology and faith, fully to appreciate the mysteries and beauties of creation, the grandeur of nature and natural laws, and truly to love and honor the vocation which, above all others, brings man into close communion with God. In short, it is safe to assert that no human occupation requires so long a course and wide a range of study, to comprehensively fit a person for its intelligent and profitable pursuit, as agriculture."

Boys will not willingly enter on a life requiring no thought, or having the reputation of requiring none. How many farmers talk over with their boys such topics as drainage, history of breeds of horses, cattle, sheep, and swine, and their adaptation to certain purposes; farm economy, stock breeding, rotation of crops, manures; care of farm premises, implements, accounts, marketing, agricultural law, and literature? If boys were shown clearly that perception, reason, judgment, memory, and even imagination were given to man because he needs them in tilling the earth; in selecting and enriching his soils, adapting his crops to the condition and needs of his land, choosing seeds, and selecting markets; in breeding and feeding healthy, thrifty animals, thoughtfully preparing for a market months or years before hand, keeping such account of his operations that his annual balance tells him what crop or stock pays him best; in improving the construction and arrangement of buildings, they would be inspired with tastes and desires which increase their respect for farming, awaken a real love for the farm, and secure their contentment and usefulness. If, in addition to setting the boys' wits at work, you give them some personal share in the profits of field, garden, animals; something to be their own, so that their interest is identified with yours, you will have strengthened the tie that binds them to husbandry.

If we would have the boys stay on the farm, something must be done for social recreation and amusement in the country. If the boy is a turbulent population, he is also a gregarious being. His desire to see others and find in company relief from life's perpetual grind, is a sign of health, and fortunately is increasing with each new generation. Our grandfathers had no time for amusements, and if they ever took a holiday it was in eating or drinking to excess, or in giving utterance to their bigoted piety. Forty or fifty years ago —and now among people forty or fifty years behind the times—in the hard teachings of the orthodox church to save your soul meant chiefly to deny yourself in the matters of dancing, cards, the theatre, or any "carnal amusement." Mammon was not so much the god of evil passions, selfishness, backbiting, and evil speaking as of pretty clothes, luxury, art, music, the drama, novels, and the thousand modes of relief which modern knowledge and taste find for the mind from the eternal work of money getting. If the theatre is not respectable, and dancing is a device of the devil, the boys' desire for fun of some kind is thoroughly healthy and natural; and if they do not have lawful pleasures they will have unlawful ones. If they do not have company, games, amusements, social amenities under their father's roof, with such quiet surroundings as befit those bred to be gentlemen, they will have them somewhere and somehow; and it may be among loafers and gamblers at the nearest tavern, where the offense is rum and smells to heaven. If giving the boys rooms of their own nicely fitted up, and letting them invite in their friends once in a while and learn to be hospitable hosts to the extent of an occasional feast costs something, remember no money is wasted which develops in the right direction a boy's healthy character, helps to soften and humanize him and makes dearer and more attractive to him his home and family. A Southern writer says, "If farmers do not occupy the highest social position it is their own fault. Those who possess all the knowledge needed on the farm have within themselves the elements necessary to make the society in which they mingle more brilliant and desirable than any other class of people in the world." There is no longer any need of undergoing the isolation and privations of frontier life. However poor one may be, there are plenty of chances for his skill, strength, and enterprise in the older fields near the populous market and within reach of the public library, lyceum, lecture, reading club, grange, farmer's club, evening party, church social, and holiday festivity. And in any farming community away from town two or three dozen young people of congenial tastes, habits, and social belongings could easily meet at one another's houses one evening a week for several months in the year. A little fund would provide them books, which read aloud in company and discussed would not only make a delightful entertainment but furnish topics for conversation and food for thought between times. Other elements, music, charades, recitations, parlor theatricals, stories, essays, and debates according to the accomplishments and tastes of the different members of the company might be introduced. And no sensible person will deny that such gatherings of people of common pursuits, a general ground of communion, correspondence of position, of education, of moral sentiment, of social sympathy, of similar tastes and habits of thought would be far pleasanter and more profitable than the more stylish, common social gathering of the average village where a snob, a toady, a swell, a rich man, a poor man, a grocer, a farrier, a blacksmith, a soap-maker, a doctor of music and demented pianos, a stage driver, a dancing master, a landlord, a clerk, a fop, a fool, and a fiddler and their wives or sweethearts come together to retail gossip and regale themselves on stale jokes, frozen puddings, glucose jellies, musty almonds, mouldy raisins, and sour oranges.

The boys demand that the farm shall be more than a place to stay and rear families in, in the strictest economy, starving the soul to add a few more acres to what is not now properly cultivated. It must be a home, where contentment, professional pride, and the spirit of progress meet; a home speaking of plenty and rich in attractions; the cosy parlor and library, with newspapers, magazines, poetry, history, music, and pictures. While it must be a busy home, it need not be all kitchen and dairy, all plow and hoe, all an endless routine of treadmill duties; but a place where the farmer and his family may find time every day to mingle with books and in conversation, growing larger in judgment and finer in taste; and where often the table may be the gathering place of friends, where the domestic and social affections are abundantly fed.

When the farmer ceases to rail against his own occupation, and makes his watchword improvement and the elevation of his calling; when he knows that a dollar's worth of pure pleasure is worth more than a dollar's worth of anything else under the sun; when he stops attempting more work than can possibly be done, making his own and his family's life one of endless drudgery, and sees that working is not living, and that living is present, not future; when he sees that scientific training is necessary to progress in agriculture, and that brain work as well as hard work may be made to increase the income; when his life is so adjusted that the body is servant of the soul, and his home is the abode of refinement and the center of a circle of multiplied associations; when he sees that, all things considered, his business is the surest and in the end the most profitable of any occupation on earth, and that the chances of real success are greater on the farm than anywhere else; when sound, sagacious men who, by study and practice, "have pitted themselves for service on life's battle field," keep alive by their intelligent, conciliatory but energetic devotion, the farmers' alliance, clubs, or granges, and lend their intelligence and influence to elevate and direct their neighborhood or township in the way of usefulness; when among those to whom the welfare of the country is committed, there shall be a larger sprinkling of honest, intelligent, broad-visioned, liberal-minded farmers, so that the boys on the farm may see public honors in the line of their promotion as well as of the lawyers, when, with the scent of the clover, the fields, and the free, pure air, is mingled the ease, the gentility, the culture, refinement, and social amenities of the best town life, then it will require no effort to keep the boys and girls on the farm.

EXPERIMENTS WITH ENSILAGE.

MADE BY THE FARM DEPARTMENT OF THE MICHIGAN STATE AGRICULTURAL COLLEGE, 1882-3.

Is an acre of corn grown for fodder, ensilaged—worth more to feed cattle—will it go farther than if cut up and dried in the ordinary way? is a question often asked, but still not answered conclusively. While the answer possibly may be in the negative (I am not of that opinion), it by no means follows that ensilage would not even then have a very important place among our cattle foods. If the reply should be in the affirmative, then, on the score of economy, convenience in handling, and value, it would be almost indispensable on a stock farm. This would be especially true where cows were kept for dairy purposes, as ensilage being a succulent food, is calculated to produce a liberal yield of milk.

To still further test the value of ensilage as a practical, economical method of storing and preserving fodder fresh and juicy for winter feeding—as a chief substitute for roots—as a part ration with straw and coarse fodders, and especially in comparison with corn grown on adjacent plats and under the same conditions as the ensilage; but cut up and cured with great care in the ordinary way—were the thoughts in mind in planning our feeding experiments for 1882 and '83.

ANIMALS CHOSEN FOR THE EXPERIMENT.

Three lots of cattle were selected from the college herd December 18, 1882.

Lot I.

consisted of three bulls, two Short-horns, and one Ayrshire. No. 1, a Short-horn bull calf, aged 9 months; No. 2, an Ayrshire bull, aged 15 months; No. 3, a Short-horn bull, aged 14 months.

Lot II.

was composed of two large dry cows, Short-horns, nearly alike as to weight, condition, and feeding qualities. No. 4, aged 6 years; No. 5, aged 8 years.

Lot III.

was made up of four milch cows; three Ayrshires, and one Short-horn. No. 6, Ayrshire, aged 3 years, calved October 2, 1882; No. 7, Ayrshire, aged 4 years, calved September 29, 1882; No. 8, Ayrshire, aged 4 years, calved October 4, 1882; No. 9, Short-horn, aged 4 years, calved November 24, 1882.

PREVIOUS TREATMENT.

Owing to the mildness of the fall weather the cows were turned out during the day until about the first of December, when they were given dry cornstalks and meal twice daily. The three bulls had been let out during the summer previous, only for exercise.

During the month of November all the cows selected for the experiment had lost weight except No. 4 (Stewart Queen 9th), she having gained nothing. The bulls had each gained in weight.

They were all in good or fair condition except No. 9 (Hermia 2d); she, having dropped a calf a short time previous, was rather thin in flesh.

TREATMENT DURING THE EXPERIMENT.

The cattle were attended throughout the experiment by one person, and pains was taken to secure regularity in everything pertaining to the feed and care of the animals.

The animals were fed regularly three times daily at 6:15 A. M., 11:30 A. M., and 4:30 P. M. They were watered in the stall at 9 A. M., and had access to water when turned out to exercise, from 2 P. M. till 4 P. M.

The milking was done just defore the regular morning and evening feedings.

The animals were daily groomed with card and brush; the stables were cleaned and littered both morning and afternoon. Salt was given regularly three times each week. They were weighed on putting up, and regularly each week thereafter at 3:30 P. M. The time of feeding consisted of periods of three weeks each.

FEED AND FEEDING NOTES.

The rough feed was cut into one-fourth and one-half inch lengths by a power cutter. The cornstalks, dried corn fodder, and hay were all of good quality. The meal had 14 parts corn meal, 4 parts oat meal, and 9 parts wheat bran by weight.

During the second and third periods the bulls had daily one pound of oil meal each, besides their regular feed of corn and oat meal and wheat bran. One pound per day of oil meal was given No. 8 during the third week of the first period. Exact notes were kept of feed given to each animal, and if any was left in mangers it was weighed and deducted from amount given.

COMPARISONS BY LOTS.

Lot I.

During the first period this lot had a daily ration of 15.95 pounds of meal 38.90 pounds hay, and 44.75 pounds roots. During second period 20 pounds of meal, 28.89 pounds of hay, and 42.89 pounds of ensilage. During the third period 20 pounds of meal, 29.73 pounds of hay, and 69.77 pounds of ensilage.

GAINS IN WEIGHT.

	Gain.
First period	187 lbs.
Second period	83 "
Third period	118 "

They were each given all the hay they would eat during the three periods, and during the first period nearly all the roots they would eat. During the second and third periods ensilage was substituted for roots, and they had what they would eat up clean once a day.

Lot II.

During the first period this lot had a daily ration of 6 pounds of meal, 12 pounds of hay, and 29.42 pounds of cut corn stalks; during the second period 6.38 pounds of meal, 12 pounds of hay, and 89.94 pounds of ensilage; during the third period 6 pounds of meal, 12 pounds of hay, and 105 pounds of ensilage.

GAINS IN WEIGHT.

	Gains.
First period	126 lbs.
Second period	22 "
Third period	32 "

During the first period they had all of the cornstalks they would eat, but when ensilage was substituted for the cornstalks they were limited to 50 and 55 pounds respectively.

Lot III.

During the first period this lot received 28.33 lbs. of meal and 78.34 lbs. of dried corn fodder.

During the second period 28 lbs. of meal and 236.62 lbs. of ensilage.

During this period the lot was divided; Nos. 6 and 7 receiving as a daily ration 14 lbs. of meal and 133.06 lbs. of ensilage, about the same amount they had received during the second period. While Nos. 8 and 9 received 14 lbs. of meal and 37.09 lbs of dried corn fodder, about the same amount they had received during the first period.

Number 8 during the second period received, in addition to the regular feed, a feed of 3.42 lbs. of hay per day.

GAIN OR LOSS IN WEIGHT.

	Gain.	Loss.
First Period	......	133
Second Period	116	......
Third Period (Nos. 6 and 7)	24	......
Third Period (Nos. 8 and 9)	......	50

	Milk Yield.	Daily Average.
First Period, Lot III (Nos. 6 and 7)	614½	29.26
Second Period, " " " " "	636½	30.30
Third Period, " " " " "	584½	27.83
First Period, Lot IV (Nos. 8 and 9)	681½	32.45
Second Period, " " " " "	655	31.19
Third Period, " " " " "	569½	27.11

From the table it is seen that during the first period, when the ration was simply meal and dried corn fodder, that there was a loss of 133 lbs. of flesh, but that when ensilage was substituted for dried corn fodder, there was a marked increase of 116 lbs., and a daily increase of milk.

During the last period the cows fed on ensilage still gained, while those fed dried corn fodder lost in weight. Although during the first and second periods lot IV gave considerable more milk than lot III, yet when, during the third period, lot IV had dried corn fodder substituted for ensilage, their yield of milk fell below that of lot III.

BY INDIVIDUALS.

No. 1.

Time Fed.	Daily Ration.	Gain.
First period	Meal, 4.95 lbs.; hay, 9.46 lbs.; roots, 14.28 lbs.	26
Second period	" 6 " " 7.11 " ensilage, 10.52 lbs.	24
Third period	" 6 " " 7.37 " " 21.11 "	38

The decrease in the amount of gain the second period was due to the fact that it took this animal some time to become accustomed to eating ensilage.

During the third period the amount of ensilage was increased, and there was quite an increase in weight.

We have rarely found an animal that does not eat the ensilage with avidity from the start.

No. 2.

Time Fed.	Daily Ration.	Gain.
First period	Meal, 5 lbs.; hay, 13.24 lbs.; roots, 15.23 lbs.	71
Second period	" 6 " " 9.26 " ensilage, 15.30 lbs.	11
Third period	" 6 " " 10.06 " " 23.33 "	24

During the second period there was a greater falling off in this case than in the other, but nearly as large a gain during the third period.

No. 3.

Time Fed.	Daily Ration.	Gain.
First period	Meal, 6 lbs.; hay, 16.16 lbs.; roots, 15.23 lbs.	90
Second period	" 8 " " 12.21 " ensilage, 17.06 lbs.	48
Third period	" 8 " " 12.16 " " 25.33 "	56

Notes on No. 1 apply here.

Table Showing by Periods of three Weeks, the Results of the Feeding Experiment.

Number of Lot.	Number of Animal.	Name of Animal.	Number of Period.	Average Daily Ration.							Total Feed Consumed.	Weights:—Gains and Losses.					Milk Yield.			
				Meal.	Cut Hay.	Cut Corn-stalks.	Cut dried Corn-fodder.	Ensilage.	Sliced Rutabagas.	Full Ration.		Weight at beginning of period.	Weight at end of period.	Gain in weight.	Loss in weight.	Gain per cent of Live weight.	Total No. pounds.	No. pounds gain.	No. pounds shrinkage.	Daily Average.
Lot. I.	1	College Baron.	1	9.45	9.46	-----	-----	-----	14.28	28.69	601	770	796	26	--	3.3	------	----	----	------
			2	6.	7.11	-----	-----	10.52	-----	23.63	496	796	820	24	--	3.	------	----	----	------
			3	6.	7.37	-----	-----	21.11	-----	34.48	724	850	888	38	--	4.7	------	----	----	------
	2	Horace of Lansing	1	5.	13.24	-----	-----	-----	15.23	33.47	702	683	754	71	--	10.4	------	----	----	------
			2	6.	9.26	-----	-----	15.30	-----	30.56	641	754	765	11	--	1.4	------	----	----	------
			3	6.	10.23	-----	-----	23.33	-----	39.56	830	780	804	24	--	3.	------	----	----	------
	3	Hebe's Baron.	1	6.	16.16	-----	-----	-----	15.23	31.39	659	890	980	90	--	11.	------	----	----	------
			2	8.	12.21	-----	-----	17.06	-----	37.27	782	980	1028	48	--	4.9	------	----	----	------
			3	8.	12.16	-----	-----	25.33	-----	45.49	955	1050	1106	56	--	5.3	------	----	----	------
Lot II.	4	Crystal Queen 9th.	1	3.	6.	13.44	-----	-----	-----	22.44	741	1400	1430	30	--	2.1	------	----	----	------
			2	3.19	5.80	-----	-----	43.52	-----	52.51	1102	1430	1460	30	--	2.	------	----	----	------
			3	3.	6.	-----	-----	50.	-----	59.	1239	1440	1454	14	--	.9	------	----	----	------
	5	Bonny Red Rose.	1	3.	6.	15.97	-----	-----	-----	24.97	524	1512	1608	96	--	6.3	------	----	----	------
			2	3.19	6.	-----	-----	53.09	-----	62.28	1307	1608	1600	--	8	----	------	----	----	------
			3	3.	6.	-----	-----	55.	-----	64.	1344	1580	1598	18	--	1.1	------	----	----	------
Lot III.	6	Phylletta.	1	7.	-----	-----	21.42	-----	-----	28.42	596	887	864	--	23	----	325½	----	----	15.50
			2	7.	-----	-----	-----	64.94	-----	71.49	1501	864	902	38	--	4.3	339	13½	----	16.14
			3	7.	-----	-----	-----	67.24	-----	74.24	1559	890	918	28	--	3.1	309	----	30	14.71
	7	Stewart Queen.	1	7.	-----	-----	21.99	-----	-----	28.99	608	960	954	--	6	----	289	----	----	13.76
			2	7.	-----	-----	-----	63.78	-----	70.78	1486	954	966	12	--	1.2	297½	8½	----	14.16
			3	7.	-----	-----	-----	66.11	-----	73.11	1535	960	956	--	4	----	275½	----	22	13.11
	8	Lulu of Lansing	1	7.	3.42	-----	12.18	-----	-----	22.60	474	926	892	--	34	----	187½	----	----	8.92
			2	7.	-----	-----	-----	43.47	-----	50.47	1059	892	912	20	--	2.2	191½	4	----	9.11
			3	7.	-----	-----	17.73	-----	----	24.73	519	910	910	--	--	----	170	----	21½	8.09
	9	Hermia 2d.	1	7.	-----	-----	22.73	-----	-----	29.73	624	1250	1180	--	70	----	474	----	----	22.57
			2	7.	-----	-----	-----	65.47	-----	72.47	1517	1180	1226	46	--	3.9	463½	----	10½	22.07
			3	7.	-----	-----	19.35	-----	-----	26.35	553	1170	1120	--	50	----	399½	----	64	19.02

TEMPERATURE.

The temperature was much colder during the entire period of feeding than during the experiments a year ago. At 8 o'clock each morning a note was taken of the temperature as indicated by the thermometer, the direction of the prevailing wind, the aspect, and the humidity.

The prevailing wind on a majority of days was from the southwest.

	1st Period.	2d Period.	3d Period.
The maximum temperature................	40°	31°	48°
" minimum "	6°	-18°	-10°
" average "	25.66°	11.85°	19.18°

I am under obligations to the Chemical Department over which Dr. Kedzie presides, for the following analyses of samples of the ensilage and fodder corn used in the experiments.

The corn fodder contained 22.85 per cent of water, the ensilage contained 79.60 per cent of water.

The results of analysis are calculated water free.

	Corn Fodder.	Ensilage.
Cellulose or fiber	32.15	27.75
Carbo-hydrates (not fat)	52.02	46.42
Albuminoids (protein)	7.00	7.15
Ether extract, fat, wax, etc	1.95	1.19
Ash	6.88	5.49
Acid	----	12.00
	100.00	100.00

The per cent of carbo-hydrates and albuminoids in the ensilage show it to have been of good quality. The per cent of acid seems large; but not larger than some other samples here shown.

CORN FODDER GROWN FOR ENSILAGE AND FOR DRIED FODDER.

The land upon which it was grown was a sandy loam. Bailey's ensilage corn and Chester county corn were grown on the same plat in rows four feet apart, dropped in drills and covered with hoes. It was cultivated four times with a one-horse double-shovel cultivator. It attained a large growth, had a few ears and had become a little brown at the butts of the stalks when cutting was commenced September 12. The filling of the silo being finished September 15, it was covered September 16 and weighted with 100 pounds of stone to the square foot.

The area of corn put in the silo was 211 rods, yielding 46,763 pounds. The dried corn fodder was grown on an area of 64 rods, yielding, when dried, 4,350 pounds. This would make the weight of ensilage grown on one square rod 221 pounds, or 35,360 pounds per acre. The yield of dried corn fodder per rod was 68 pounds and 10,880 pounds to the acre. In other words, 3¼ pounds of ensilage makes 1 pound of dried fodder.

The weight of corn in silo—weighed as it was put in September 12, 13, 14, 15—51,433 pounds. The silo was opened December 15 and each load taken out was carefully weighed and a record kept. Finished the feeding April 1, but a few cubic feet of the ensilage left in the silo at this writing, June 8, seems after the surface is removed in a good state of preservation. The number of pounds weighed out was 44,315. This indicates a loss of 7,118 pounds or about 15 per cent. I estimate the loss in weight of the fodder corn by drying out in the barn about the same as ordinary hay from 15 to 25 per cent.

The analysis of the fodder corn shows a large per cent of water, although the fall had been quite favorable for curing thoroughly. I have always found difficulty in drying corn fodder so that it could be stored without injury in large quantities. Here is one advantage in storing in a silo: If the work has been properly attended to, cover and weights on, you may be quite certain that the ensilage will come out in good shape. You will be saved the vexation of watching and turning your fodder, unbinding and binding, and seeking out new devices to prevent the fodder corn from moulding, which it is so likely to do. I am inclined to believe that the green corn can be cut and placed in the silo at as little cost as the fodder can be cut, dried and passed through the cutting box before feeding; and this, too, at a season of the year when the work can be more economically performed than in the winter.

SILOS.

I need only add to my former report on this point that experience confirms the statement then made that any material may be used in the construction of silos that will exclude the air; that it is better to have several silos, or divisions rather than a very large one; that weighting with stone, barrels of earth, or sacks of grain is likely to be more satisfactory than a screw which may not receive attention at the right time; and that the silo is one of the most economical methods of providing shelter for fodder. In no way, perhaps, can the same equivalent in dried fodder be secured with so little expense. Several silos were built in the State last year of wood, and I have yet to learn that any one of them has proven a failure.

The results of the experiment so far as comparing ensilage with dried fodder corn show that when ensilage was substituted for the fodder corn in the second period there was an increase in the weight of the cows and in the milk yield from Nos. 6, 7, and 8, while No. 9 shows an increase in weight, but a shrinkage in milk yield. I should here say that the corn fodder was of good quality and the cows were fed what they would eat clean. It will be noticed that the daily ration of corn fodder equals in weight nearly one-third of the daily ensilage ration. I am confirmed in the belief that three tons of the ensilage is equal in feeding value to one ton of hay. The yield of ensilage corn was eighteen tons per acre, equivalent in feeding value in a combined ration to six tons of hay. Ensilage means the growing of an equivalent to six or ten tons of hay per acre. Admit, only, that three pounds of ensilage will take the place of one pound of hay in a mixed cattle ration, even then if animals fed with it thrive, are healthy, and present a general appearance much like that resulting from grass feeding, coming out after four or five months' confinement with sleek coats, with not much, if any, loss of weight, and with no more shrinkage of milk yield than we ought reasonably to expect as the time from calving increases, we must conclude that there is some virtue in fodder prepared in this manner. Claim only this, and is it not a profitable and a practical method of securing large yields of corn, sorghum, and other forage crops, and preparing them for convenient and economical feeding?

It is to be regretted that so many extravagant statements have been made in relation to the value of ensilage—the number of cattle that could be kept from the product of a single acre, etc. Practical, thinking men have been deterred from investigating this subject and giving it such attention as it really deserves, because of the wild statements of impractical enthusiasts.

ENSILAGE A CHEAP SUBSTITUTE FOR ROOTS.

I am more than ever convinced that the idea I suggested two years ago that ensilage will prove a cheap substitute for roots, will be approved by any farmer who will make the trial. Farmers who have had experience in feeding stock know how desirable it is to have some succulent food as a part ration at least, during our long, cold winters. Roots are a desirable cattle food, but an expensive crop for the average farmer to raise and handle. But few farmers have the facilities for storing them in any quantity. They must be buried in the field; and in the winter with the thermometer below zero, digging out the roots and getting them to the stock is not a desirable task. If ensilage will give us the succulent food at less cost, in shape to be easily handled and occupying but a small space in storage, it must prove of value. What are the farmers in Michigan to do with the coarse fodders raised on our farms, but to feed them. They are too bulky to transport to market—they must help to make beef and mutton, but the farmer needs something to feed in connection with them to make them of more value, and the ensilage will help out in this direction.

The large number of silos erected during the last year in all parts of our country, indicates that ensilage has the sanction of a number of our leading farmers, and that actual tests confirm reasonable claims as to its value as a cattle food. The farmers of Great Britain, too, are greatly interested in this subject, and it has received the favorable attention of some of the leading English agriculturists.

To Mr. Will E. Hale, class of '82, I am under obligations for most careful and efficient aid in the carrying out of these experiments.

Respectfully submitted,
SAM'L JOHNSON,
Prof. of Practical Agriculture and Supt. of the Farm.

LANSING, June 8, 1883.

REPORT OF THE CATTLE COMMISSIONERS.

To the Secretary of the State Board of Agriculture:

A meeting of the cattle commissioners was held in Detroit on the 6th Oct. (1882), at which Messrs. Mann and Murray were present. The business coming under the consideration of the commissioners was discussed, and the following conclusions were arrived at:

1. What the measures recommended by the commissioners in the report, which they made to the Secretary of the State Board of Agriculture in 1880, are calculated to prevent the spread of contagious diseases among animals, to establish a proper system of meat inspection in the State, and to reform abuses connected with the sale of milk; and they hope that the next Legislature will give that attention to the subject which its importance demands.

2. The commissioners recommend that a committee of the Legislature be appointed to examine witnesses as to the losses occasioned by contagious diseases in this State, so that the Legislature may ascertain whether the legislation is necessary which the commissioners have advised.

3. That the remuneration of the commissioners for their past expenses and services, and for their future expenses and services should be fixed by the State Board of Agriculture.

The commissioners have but little to add to the information contained in their previous report. They may state, however, that they consider that the annual loss which is occasioned by the spread of contagious diseases is not diminishing. One of their number, under instructions from the United States Treasury Cattle Commission, visited Jackson on 2d Oct. to inquire into the losses which had occurred among a valuable herd of Ayrshire cattle during the State Fair. Four of those animals had died, and it had been reported to Dr. Baker, of the State Board of Health, that many considered that they had died of the lung plague, which is prevalent in some of the Eastern States. The investigation was made under some disadvantage, as the herd of Ayrshire cattle had been removed from Jackson before Mr. Murray's arrival, but all the evidence which could be obtained rather indicated that the cattle had died of Texas fever. The loss of those valuable animals shows the necessity of the legislation which the commissioners recommend.

Mr. Murray has also been several times called on to investigate outbreaks of disease among swine, the nature of which was not known to their owners. In those cases an examination showed that the losses were occasioned by the spread of swine fever or hog cholera, though previous to such examination they had been supposed to be dying of black tooth, from improper feeding and other imaginary causes. Similar outbreaks of disease are occurring through a wide extent of the State, and the commissioners feel that their personal experience of such matters represents a very small area of the State. The commissioners believe, however, that if a committee be appointed by the Legislature, and that if such committee is composed of practical and experienced farmers, their inquiry into the need of such legislation as the commissioners recommend, will result in something being done to prevent the losses which are suffered by the farmers and stock owners of the State, through the spread of contagious diseases.

Respectfully submitted,
S. B. MANN, *Chairman,*
A. J. MURRAY, *V. S. Secretary.*

16th October, 1882.

MICHIGAN STATE AGRICULTURAL SOCIETY.

PROCEEDINGS AND REPORTS FOR THE YEAR 1881.

OFFICERS OF THE MICHIGAN STATE AGRICULTURAL SOCIETY FOR THE YEAR 1881.

President—GEORGE W. PHILLIPS, Romeo.
Treasurer—A. J. DEAN, Adrian.
Secretary—J. C. STERLING, Monroe.

EXECUTIVE COMMITTEE.

Terms Expire January, 1882.

ABEL ANGEL, Bradley, Allegan Co.
D. W. HOWARD, Pentwater, Oceana Co.
H. O. HANFORD, Plymouth, Wayne Co.
F. M. MANNING, Albion, Calhoun Co.
A. F. WOOD, Mason, Ingham Co.
F. V. SMITH, Coldwater, Branch Co.
J. Q. A. BURRINGTON, Tuscola, Tuscola Co.
JOHN MCKAY, Cheboygan, Cheboygan Co.
JOHN GILBERT, Ypsilanti, Washtenaw Co.
C. A. HARRISON, Paw Paw, Van Buren Co.

Terms Expire January, 1883.

J. M. STERLING, Monroe, Monroe Co.
WM. BALL, Hamburgh, Livingston Co.
HENRY FRALICK, Grand Rapids, Kent Co.
A. O. HYDE, Marshall, Calhoun Co.
W. H. COBB, Kalamazoo, Kalamazoo Co.
E. W. RISING, Davison Station, Genesee Co.
PHILO PARSONS, Detroit, Wayne Co.
I. H. BUTTERFIELD, Jr., Port Huron St. Clair Co.
JOHN LESSITER, Jersey, Oakland Co.
WM. CHAMBERLAIN, Three Oaks, Berrien Co.

EX-PRESIDENTS—MEMBERS OF COMMITTEE.

GEO. C. MONRO, Jonesville, Hillsdale County.
M. SHOEMAKER, Jackson, Jackson County,
JAMES BAILEY, Birmingham, Oakland County.
H. G. WELLS, Kalamazoo, Kalamazoo County.
W. G. BECKWITH, Cassopolis, Cass County.
W. J. BAXTER, Jonesville, Hillsdale County.
GEO. W. GRIGGS, Grand Rapids, Kent County.
CHARLES KIPP, St. Johns, Clinton County.
E. O. HUMPHREY, Kalamazoo. Kalamazoo County.
W. L. WEBBER, East Saginaw, Saginaw County.

STANDING COMMITTEES.

Business Committee—JOHN GILBERT, Ypsilanti; Wm. BALL, HAMBURGH; W. H. COBB, Kalamazoo.

Transportation Committee—J. M. STERLING, Monroe; W. L. WEBBER, East Saginaw; W. J. BAXTER, Jonesville.

Committee on Finance—HENRY FRALICK, Grand Rapids; F. V. SMITH, Coldwater; E. W. RISING, Davison Station.

Committee on Premiums—WM. BALL, Hamburgh; W. J. BAXTER, Jonesville; I. H. BUTTERFIELD, JR., Port Huron; H. O. HANFORD, Plymouth; W. H. COBB, Kalamazoo; JOHN LESSITER, Jersey.

Committee on Rules—C. A. HARRISON, Paw Paw; A. F. WOOD, Mason; J. M. STERLING, Monroe.

Committee on Reception—PHILO PARSONS, Detroit; H. G. WELLS, Kalamazoo; M. SHOEMAKER, Jackson.

Committee on Programme—W. H. COBB, Kalamazoo; A. O. HYDE, Marshall; F. V. SMITH, Coldwater.

Committee on Printing—A. J. DEAN, Adrian; E. O. HUMPHREY, Kalamazoo; J. C. STERLING, Monroe.

EXECUTIVE SUPERINTENDENTS.

Cattle—I. H. Butterfield, Jr.
Horses—W. H. Cobb.
Sheep—J. Q. A. Burrington.
Swine—John Lessiter.
Poultry—John McKay.
Miscellaneous—A. F. Wood.
Fine Arts—C. A. Harrison and Wm. Chamberlain.
Music—John Gilbert.
Children's Department—Mrs. Gen. A. S. Williams and Miss Minnie Brow.
Manufacturers—F. V. Smith.
Agricultural—D. W. Howard.
Machinery—F. M. Manning.
Farm Implements—H. O. Hanford and Abel Angel.
Dairy—Charles Kipp.
Vehicles—Wm. Ball.
Forage—E. W. Rising.
Police—J. M. Stering and Henry Fralick.
Gates and Gate Keepers—Henry Fralick, F. V. Smith, and E. W. Rising.

General Superintendent—W. G. BECKWITH, Cassopolis.
Chief Marshal—A. O. HYDE, Marshall.

PROCEEDINGS OF THE MICHIGAN STATE AGRICULTURAL SOCIETY FOR THE YEAR 1881.

SPECIAL MEETING.

Hibbard House,
Jackson, March 31, 1881.

A meeting of the Locating, Business, Transportation, Programme and Printing Committees of the Michigan State Agricultural Society held this day was called to order by President Phillips and the following named gentlemen were present: President, Geo. W. Phillips; Treasurer, A. J. Dean; Messrs. W. J. Baxter, John Gilbert, Wm. Ball, of the Locating Committee; Mr. J. M. Sterling, of the Transportation Committee; Messrs. W. H. Cobb, A. O. Hyde, and F. V. Smith, Programme Committee, and J. C. Sterling of the Printing Committee, Messrs. M. Shoemaker and A. F. Wood, Executive Committee.

Mr. Baxter moved, and it was supported and carried, that all members of the Executive Committee who shall be present at this meeting are invited to take an active part in the meeting, and to vote on the question of locating the fair.

Mr. Baxter, Chairman of the Business Committee, reported that he had examined the Jackson fair grounds and buildings and explained to the Citizens' Committee what additional buildings, pledges, etc., would be required from them before a proposition for holding the fair in their city would be entertained.

Mr. Baxter then stated that when he was appointed Chairman of the Business Committee he informed the Executive Committee that his name was being used in connection with another office, and that it would be impossible for him to attend to the duties of this office; he then asked to be excused. He had now received the appointment referred to, and therefore tendered his resignation as Chairman of the Business Committee.

Mr. Smith moved that Mr. Baxter be requested to withdraw his resignation. Carried.

The president then read a renewal of the invitation from the State Board of Agriculture, asking the Society to meet with them at the Agricultural College, and naming June 9 as the date of such meeting. The invitation was accepted with thanks.

On motion the meeting adjourned until 8 o'clock to-morrow morning.

J. C. STERLING, *Secretary*.

GEO. W. PHILLIPS, *President*.

Jackson, April 1, 1881.

The committees resumed business at 8 o'clock A. M. as per adjournment, President Phillips in the chair. Present: President Phillips, Treasurer Dean, Messrs. Baxter, Ball, Gilbert, Sterling, J. M. Cobb, Hyde, Smith, Wood, and the Secretary.

Minutes of last evening's meeting were read and approved.

Mr. Baxter then read the following communication:

To Hon. Geo. W. Phillips, President of the Michigan State Agricultural Society:

Dear Sir,—Having been appointed Secretary of the State Board of Charities, I shall be utterly unable to perform satisfactorily to myself or to you the duties of Chairman of the Business Committee of your Society, and hereby tender my resignation, and ask that it be accepted at once, and that I may be entirely relieved of its duties. I feel, also, compelled to ask you to designate another member of the Executive Committee to take charge of the art department of the fair. I can assure you and other members of the Board that my interest in the prosperity and success of the Society is undiminished, but the office I have accepted demands and must have my entire time and my best services.

Respectfully yours,

W. J. BAXTER.

March 31, 1881.

On motion of Mr. Ball the resignation was accepted, to take effect June 9, 1881.

The president appointed Business Committee as follows: Messrs. John Gilbert, Wm. Ball, and W. H. Cobb.

Mr. Baxter, from the committee to visit fair circuit meeting, reported verbally. On motion, the report was accepted.

The president then announced the following standing committees:

Fine Arts—Messrs. C. A. Harrison and Wm. Chamberlain.

Miscellaneous Department—Mr. Amos F. Wood.

The subject of locating the fair for 1881 was taken up and remarks were made by members of the Board, and Messrs. Smith, Clark, and Robinson, from the Jackson Citizens' Committee.

Mr. Smith submitted a proposition from the citizens of Jackson.

The committee then took a recess until half past 1 o'clock.

Afternoon Session.

The committee was called to order at 1:30 P. M. by President Phillips.

Present, same members as at previous roll call.

A proposition for holding the fair from the citizens of Adrian was received, offering $3,000 in cash, good grounds, good buildings, a good half mile track, etc.

A proposition from the citizens of Jackson was then read and accepted, contract drawn and signed, and the fair located at Jackson.

The following programme was then adopted for examination of horses, cattle, sheep, swine, and poultry:

It is expected that all animals and articles will be in their places by Monday, at 6 P. M., the first day of the fair. As will be seen, the examination of stock by the judges commences promptly on Tuesday, at 9 o'clock A. M.

Tuesday, September 20.

HORSES.—At 9 A. M., Class 12, thorough-breds; at 10 A. M., Class 17, draught horses

SHEEP.—The examination of sheep (fine wools) will commence at 9 A. M., and will continue, under the direction of the superintendent, until all the classes in this division are judged. The same order will be followed with swine and poultry. The examination by the judges will commence in these divisions (sheep, swine, and poultry) on Tuesday at 9 A. M., and will proceed in the order of premium list, from day to day, until the work is completed.

Tuesday Afternoon, September 20.

Chariot race at 1 P. M.

CATTLE.—At 1 P. M. sharp, the examination of cattle will commence with Class 1, Short-horns, and continuing in the order of the premium list until all are judged. It is thought that this will bring the exhibition of herds on Thursday afternoon.

At 2 P. M., grand cavalcade of all horses and cattle entered for exhibition. It is expected that every animal will take its assigned place promptly on the track.

At 4 P. M., examination and speed trial of 3-year-old stallions, Class 19.

At 4:30 P. M., examination and speed trial of 2-year-old stallions, Class 19.

Wednesday Forenoon, September 21.

HORSES.—At 9 A. M., Class 13, horses of all work; at 9:30 A. M., Class 16, gents' driving horses; at 11 A. M., Class 18, carriage and buggy horses.

Wednesday Afternoon, September 21.

Chariot race at 1 P. M.

HORSES.—At 2 P. M., examination and speed trial, Class 20, of 3-year-old mare and geldings; at 2:30 P. M., examination and speed trial of 2-year-olds; at 4 P. M., Class 20, under saddle, of thorough-bred mares or geldings, any age over three years.

Thursday Forenoon, September 22.

HORSES.—At 9 A. M., Class 14, roadsters; at 10 A. M., Class 15, breeders' stock.

Thursday Afternoon, September 22.

Chariot race at 1 P. M.

At 2 P. M., Class 19, 4-year-old stallions in harness; at 2:30 P. M., Class 20, 4-year-old mares and geldings in harness; at 4 P. M., Class 20, thorough-bred or partly thorough-bred stallions, any age, to saddle.

Friday Forenoon, September 23.

STALLIONS.—At 9 A. M., thorough-breds with six of their get; all-work, with six of their get; roadsters, with six of their get; draught, with six of their get.

At 11 A. M., Class 20, mares and geldings, five years old and over, to harness, speed trials, mile heats, best 3 in 5.

Friday Afternoon, September 23.

Chariot race at 1 P. M.

At 2 P. M., Class 20, stallions, five years old and over, to harness, speed trials, mile heats, best 3 in 5.

W. H. COBB,
A. O. HYDE,
F. V. SMITH,
Committee on Programme.

Meeting Adjourned.

GEO. W. PHILLIPS, *President.*

J. C. STERLING, *Secretary.*

LANSING MEETING.

LANSING, June 1st, 1881.

In pursuance of a resolution adopted at the last winter meeting by the Executive Committee, a meeting was this day held in the Hudson House, and was called to order by President Phillips. Roll called, and the following gentlemen found present:

President, Geo. W. Phillips; Treasurer, A. J. Dean; ex-Presidents, H. G. Wells, M. Shoemaker, G. W. Beckwith, and E. O. Humphrey; Messrs. J. M. Sterling, E. W. Rising, H. O. Hanford, Wm. Ball, John Lessiter, W. H. Cobb, Henry Fralick, F. M. Manning, J. Q. A. Burrington, A. F. Wood, D. W. Howard, Wm. Chamberlain, C. A. Harrison, John Gilbert, I. H. Butterfield, Jr., and the secretary.

Communications were received from Messrs. W. L. Webber and W. J. Baxter, stating that business engagements would prevent their attending the meeting.

The secretary read a letter from Mr. W. H. Utley, which was accepted and placed on file.

Mr. J. M. Sterling reported for the chairman of the Business Committee, showing amount received for lumber, forage, etc., sold as $657.76, which amount had been paid to the treasurer. Business orders issued since June 1, 1881, amount to $1,960.87; and further reported the condition of grounds and buildings belonging to the Society.

On motion, the report was accepted and adopted.

Mr. Fralick offered the following resolution, which was supported by Mr. Hanford:

Resolved, That the Executive Committee approve of the action of the Business Committee, taken under the resolution passed at the last winter meeting, in the disposition made of the grounds and buildings at Detroit, so far as they have gone, and all that part of said resolution which directed them to take all the buildings down, be rescinded, and that the further disposition of the remaining buildings on the grounds be left to the discretion of the Business Committee, to take such action as in their judgment will promote the best interests of the Society.

Mr. Sterling, Chairman of Transportation Committee, reported for that committee that they had secured same arrangements for freight and passengers as in former years, viz.: Free transportation on stock and articles for exhibition when returned to place of shipment, on all roads in the State save the Lake Shore & Michigan Southern and the Canada Southern; these companies will carry freight for half rate. Round trip tickets to passengers will be sold at price of a single fare on all roads.

The Michigan Central Railroad will transport lumber from Detroit fair grounds to Jackson for $5 per car. Report accepted.

On motion of Mr. Dean the Secretary was instructed to insert the words geldings and mares after the word horse at the head of class 17, in the premium list.

Mr. Dean, Chairman of Committee on Printing, reported that the committee had contracted for 5,000 premium lists for $202.50.

Mr. Bell moved, and it was supported, to insert the words except in classes 19, 20, and 21 in the premium list at the head of Division B. Carried.

Mr. Cobb, from the Committee on Programme, stated that he had received several communications from horse-breeders, asking that the speed trial in class 20 be changed from one mile to one-half mile tests. After some debate on the subject it was referred to the Committee on Programme, with power.

Treasurer Dean offered the following report:

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN—Under your instructions I have invested in United States bonds registered in the name of the Society $500, as follows: One bond issued July 1, 1877, No. 53,648, making an aggregate in my hands of $10,000. I paid as premium on this bond $77.50.

A. J. DEAN, *Treasurer.*

On motion the report was accepted and referred to the Finance Committee, who reported as follows:

To the President and Executive Committee of the Michigan State Agricultural Society:

The Finance Committee, to whom was referred the report of Treasurer Dean, of his purchase of a $500 U. S. 4 per cent bond for said Society, at a cost of $577.50, being a premium of 15½ per cent,—$77.50,—respectfully report that they have examined his vouchers of said purchase, and find and report the same correct, and we recommend that an order be drawn on the treasury, in his favor for $77.50, the amount paid by him for said premium, and the $500 bond remaining in his custody as treasurer.

All of which is respectfully submitted.

HENRY FRALICK,
E. W. RISING,
Finance Committee.

LANSING, June 1, 1881.

On motion, the report was accepted and adopted.

President Phillips announced that conveyances would be provided to take invited guests to the Agricultural College Farm, and would be ready to start from this house at 9 o'clock to-morrow A. M.

The committee on rules reported the following rule, which was adopted:

"Hay and straw will be provided for live stock on the grounds, free of charge, from the Saturday preceding to the close of the fair, in the following quantities per day: Hay for cattle, 20 lbs.; for horses, 15 lbs.; for sheep, 3 lbs.; and straw sufficient for bedding. Exhibitors in Division A, B, and C will secure certificates from the superintendents of their departments, stating amount of hay and straw they are entitled to draw, and shall present the same to the Superintendent of Forage. Grain and feed will be provided for sale on the grounds, at the usual market rates."

A communication from Messrs. J. Becker & Son, Detroit, asking the Society to allow them to exhibit the manufacturing of pianos in Division K.

On motion, the communication was accepted and placed on file.

It was then moved and supported to rescind the action of this board, had at its March meeting, in accepting the resignation of Mr. Baxter as chairman of the Business Committee. Carried.

On motion, Mr. Baxter's resignation was accepted to take effect June 1, 1881.

On motion, M. J. Sterling was requested to act with the Business Committee in settling matters pertaining to the fair-grounds and buildings at Detroit.

On motion, the meeting adjourned to meet at 8.30 o'clock to-morrow A. M.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

HUDSON HOUSE,
Lansing, June 2, 1881.

The Executive Committee met at 8:30 o'clock A. M. pursuant to adjournment, President Phillips in the chair. Roll called, quorum present.

The Committee on Rules reported as follows:

RULE 4. All entries in Divisions A, B, C, and D shall be made on or before Tuesday evening of the week preceding the Fair, and all entries of machinery and articles in Division E, and in classes 40, 41, 42, 43, and 44 of Division H, and classes 47 and 48 in Division J, must be made on or before Thursday evening of the week preceding the Fair. All other articles must be entered and in their proper places on or before Tuesday, the second day of the Fair, at 2 o'clock P. M.

Mr. Beckwith moved, and it was supported, that a committee of three be appointed by the chair to examine in to the management and workings of the Agricultural College and college farm, and to report as soon as practicable. Carried.

The chair named as such committee Messrs. Beckwith, Hanford, and Harrison.

Meeting adjourned.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

VISIT TO THE COLLEGE.

At the close of the meeting the members of the committee, in company with representatives from the State Board of Agriculture, State Horticultural Society, State Grange, and the State Pioneer Society, were treated to a pleasant drive to the Agricultural College and through the college farm. The grain fields and vegetable gardens were visited and found looking extraordinarily well. The cattle were examined and pronounced to be in fine condition. The sheep came next and were also looking well. After a promenade through the beautiful grass plats and greenhouses the visitors were escorted by members of the Faculty to the college dining room where an elegant dinner was laid for them, and was enjoyed by all present.

After dinner President Abbot led the way to the chapel where a meeting was held, with Hon. H. G. Wells, President of the State Board of Agriculture, in the chair. Short addresses were made by Judge Wells, Messrs. Wm. Chamberlain, C. G. Luce, T. T. Lyons, J. C. Holmes, Philo Parsons, Henry Fralick, W. S. George, and President T. C. Abbot.

The meeting adjourned and the guests returned to Lansing, fully convinced that the college and farm were developing more improvements each year.

PROCEEDINGS AT THE ANNUAL FAIR HELD SEPTEMBER 19TH–23D, 1881.

HIBBARD HOUSE, JACKSON,
Saturday, Sept. 17, 1881.

The Executive Committee met at 8 o'clock this evening, and was called to order by President Phillips.

The roll was called and the following named members were found present: President Phillips, Treasurer Dean, Messrs. Wood, Fralick, Harrison, Gilbert, Howard, Chamberlain, Lessiter, Cobb, Burrington, Shoemaker, and the Secretary. The Secretary read a number of entries which were received after the time for closing entries, according to the rules of the society.

Mr. Fralick moved that entries of live stock received, dated September 13th or previous to that date and bearing post-mark not later than September 14th, be accepted. After some debate on the question the motion was carried.

On motion all entries presented at this meeting and not included in the preceding motion, were tabled.

President Phillips stated that he had invited Mr. John S. Steel, of Anderson, Ohio, who arrived to-day with a fine herd of Short-horn cattle, to exhibit his herd, but informed him that he could not compete for premiums, as his cattle had not been entered, that the society would feed his stock during the fair, and arrange for his transportation, the same as for other exhibitors.

The action of the president in the matter was approved by all members present.

Mr. Harrison, Superintendent of Division M, stated that a question had arisen in his department as to whether an artist who makes and sells pictures, should be allowed to exhibit as a dealer or not.

After a lengthy debate on the question, it was moved and supported that the subject be deferred until Monday evening. Carried.

Mr. Fralick, from the Finance Committee, reported that the tickets were on hand counted and ready to be delivered to the treasurer.

On motion meeting adjourned.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

Monday Evening, Sept. 19, 1881.

A meeting of the Executive Board of the Michigan State Agricultural Society was called to order in the Hibbard House parlors at 8 o'clock P. M., by President Geo. W. Phillips. Roll called, and the following members answered to their names: President Phillips, Treasurer Dean, and Messrs. Sterling, J. M. Rising, Hanford, Ball, Lessiter, Cobb, Fralick, Hyde, Manning, Wood, Burrington, Angel, Chamberlain, Howard, Harrison, Butterfield, Gilbert, Beckwith, Baxter, Shoemaker, and the secretary.

Mr. J. M. Sterling moved that the regular order of business be suspended. Carried.

The same gentleman then moved that the society appropriate $500.00 for the sufferers by fire in Michigan, the money to be placed in the hands of

Mayor W. G. Thompson of Detroit, with a request that the amount be invested in seed wheat for the burned district.

The motion was unanimously adopted, and the secretary requested to forward the amount at once.

The president reported number of exhibitors' tickets distributed, and other transactions of his office. Report accepted.

Chairman Gilbert, of the Business Committee, reported that the committee had arranged to build fifty additional pens for sheep and swine. Mr. Burrington, Superintendent of Sheep, reported that more pens were needed in his department; that a number of sheep were now on the grounds for which he had no pens, and that more would arrive in the morning.

Mr. Lessiter, Superintendent of Swine, reported all pens full in his department, and more swine were expected to arrive during the night.

On motion, the Business Committee was requested to provide fifty pens for sheep and swine.

Mr. J. H. Butterfield, Jr., Superintendent of Division A, reported that there were twenty-four more cattle on the grounds than he could provide stalls for, and more stock was expected.

On motion of Mr. Cobb, Superintendent Butterfield was instructed to make the best arrangements possible for cattle on exhibition, at the expense of the society.

Reports were received from other departments, showing everything working smoothly.

It was moved and supported that all matters tabled at Saturday evening's meeting be taken from the table in their order. Carried.

Mr. Baxter moved that when entries bear date previous to the time for entries to close, and no post-mark is visible, the same shall be accepted, provided the parties making the entry will make affidavit that said entry was mailed on or before the 13th inst. Carried.

It was moved and supported that a committee of three be appointed to confer with gentlemen who wish to make affidavit that their entries were mailed previous to the time for entries to close. Carried.

The president appointed as such committee Messrs. W. J. Baxter, C. A. Harrison, and Wm. Chamberlain.

The question as to who shall be allowed to exhibit as a dealer in Division M, was taken from the table, and on motion of Mr. Harrison, the matter was again tabled.

On motion of Mr. Fralick, it was resolved that the annual election be held in the stand on fair grounds, where it was held in 1877.

Captain M. Dorrel of Jackson, Mr. Adolph Wheeler, Adrian, and Mr. C. W. Young of Paw Paw were duly elected judges of the election.

Mr. Hyde presented a membership certificate of 1880, issued to Mr. Thos. Shaw of Grand Blanc, Mich., and stated that Mr. S. was obliged to purchase two memberships last year, and now asked the society to refund one dollar.

On motion, the matter was laid on the table, and the meeting adjourned.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

HIBBARD HOUSE, JACKSON,
Tuesday Evening, Sept. 20, 1881.

Meeting of the Executive Board was called to order by President Phillips.

In the absence of the secretary, Mr. C. A. Harrison was chosen secretary *pro tem.*

On the roll call the following gentlemen responded to their names: President Phillips, Treasurer Dean, Members of Board: Messrs. Angel, Howard, Hanford, Manning, Smith, Wood, Gilbert, Burrington, Harrison, Ball, Fralick, Hyde, Cobb, Rising, Parsons, Butterfield, Lessiter, Chamberlain, Beckwith, and Baxter. Mr. J. M. Sterling and the secretary answered to their names later.

Mr. Baxter offered the following resolution, which was adopted unanimously by a rising vote:

The Executive Committee of the Michigan State Agricultural Society, though for some time anticipating the sad event, have heard with heart-felt sorrow of the death of James A. Garfield, the honored and dearly loved President of the United States, from the wound received at the hands of an ignoble and detestable assassin.

Resolved, That in the manner of the death of this great, good, and truly representative American, at the hands of an assassin, we all feel humiliation and disgrace that in our native land with the freest, purest, and best government on earth, any American citizen could be found so low, so vile, so base, as to take the life of the reprepresentative head of the nation;

Resolved, That in the death of James A. Garfield, in addition to our sorrow as citizens in the loss of our chief magistrate, we all feel his loss as that of a dearly loved friend, wise counsellor, and adviser;

Resolved, That we tender to his noble and devoted widow and his orphaned children, our sincere sympathy. Their sorrow is our sorrow; their loss our loss; their unutterable grief the unutterable grief of this entire nation.

The secretary took the chair and read the minutes of Saturday and Monday evenings' meetings, which were approved.

The committee appointed to confer with gentlemen wishing to make affidavit of the the time of posting their entries, offered the following:

Your committee would respectfully report that affidavits were made by Chandler H. Bills of Tecumseh, Lewis Sherwood of Ypsilanti, and on behalf of Thomas Hall of Owosso, which satisfied us the letters making entries were mailed in time required by the rules, and that the several entries made by them should be received. That the application of Mrs. Ann Newton, though accompanied by an affidavit of Wm. Newton, indicating that the same was mailed in proper time, your committee considered in connection with another affidavit of a party who was at the fair at Chicago, and in the secretary's office, from which place this application was sent, which states with positive assurance that the application was not made out on Tuesday, the 13th, when he had a conversation with said Newton at the secretary's office; and further, that Mr. Newton, when advised to send such application at once, expressed himself as satisfied that a day or two of delay would make no difference. This, taken in connection with the envelope postmarked at Chicago, Sept. 14, 2 P. M., satisfies the committee that Mr. Newton must be mistaken as to the date of sending the application, and that it was not in fact mailed until the 14th, and that the rule shuts out the entry. Two other papers were referred to your committee, viz.: S. A. Gow of Greenville, to enter five horses; mailed at Greenville, Sept. 14; application not dated; Dr. Orr, Caro, entry for three horses. No parties appeared before us to make any showing on either of these applications, and they are therefore reported back without recommendation.

W. J. BAXTER,
C. A. HARRISON,
Committee.

It was moved and supported that the report be accepted and adopted. After a considerable debate, in which, Mr. Newton, Mr. Willson, and most of the members participated, the motion was carried by a rising vote of nine to three.

A communication from the officers of the Tri. State Fair Association, was read and accepted.

On motion, the secretary was instructed to extend the hospitality of the society to the officers of the Tri. State Fair Association.

Mr. J. M. Sterling read a communication from Mr. J. Huff Jones of Detroit.

Mr. Philo Parsons then read a letter from Gen. U. S. Grant, acknowledging receipt of an invitation to attend the fair, and signifying acceptance if possible.

Upon motion, the meeting adjourned.

J. C. STERLING, *Secretary*.

GEO. W. PHILLIPS, *President*.

HIBBARD HOUSE, JACKSON,
Wednesday Evening, Sept. 21, 1881.

A meeting of the Executive Committee held this evening was called to order at 8 o'clock by President Phillips and the following named members of the Board were found present: President Phillips, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Cobb, Hyde, Fralick, Manning, Smith, Burrington, Chamberlain, Parsons, Angel, Harrison, Gilbert, McKay, Beckwith, Baxter, and the Secretary.

Minutes of Tuesday evening's meeting read and approved.

The President reported number of dinner and attendants' tickets given out Tuesday and Wednesday as follows:

Dinner tickets, Tuesday	245	
" " Wednesday	210	455
Attendants' tickets, Tuesday	1,032	
" " Wednesday	1,275	2,307

Mr. Baxter offered the following, which was accepted and adopted:

At a fair held at Jackson some four or more years since, a premium offered for the best span of working horses of a particular weight was awarded under protest and the Executive Committee sustained the protest and the award was withheld. The party entering the protest claimed the premium, but the Awarding Committee had not made such a report as justified any award by the Executive Committee, and the matter dropped. The protestant has always felt aggrieved, and on several occasions has endeavored to get a hearing, but so far without success. I move that a special committee of three be appointed to examine into the matter, and that the party protesting be permitted to appear before them, and to bring in the statements of the Awarding Committee which made the award, and such other testimony as he may desire, and that the committee make a full report at the winter meeting that a final, and if possible, a satisfactory disposition may be made of the whole matter. Committee appointed by the President as follows: Messrs. A. O. Hyde, F. M. Manning, and H. O. Hanford.

The committee appointed to receive affidavits of gentlemen whose entries were received after time for entries to close, reported in favor of accepting entries made by Dr. Orr, of Caro.

On motion the report was accepted and adopted.

Treasurer Dean reported total gate receipts for Monday, Tuesday, and Wednesday as $6,325 75-100, including receipts from grand stand.

Miss Minnie H. Brow, Superintendent of Children's Department, reported all work of awarding committees in that department completed. Total awards, $15.00; and checks for premiums drawn and ready to be delivered.

Miss Brow further reported as Superintendent of Division N (needle work), that the awards in that department were all made and books turned over to the Secretary. Total amount of premiums awarded in this department was $241.00.

Mr. Cobb, Superintendent of Division B, reported that a protest had been made against the entry of Mr. Robinson's team in class 16. On motion the matter was referred back to Superintendent Cobb with power.

Messrs. Baxter, Harrison, and Chamberlain were appointed a committee to examine affidavits and entries for special premiums offered by the Michigan Carbon Works, and to award premiums on the same.

On motion the meeting adjourned.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

JACKSON, MICH.,
Thursday Evening, Sept. 22, 1881.

Meeting of Executive Committee was called to order in the Hibbard House parlors at 8 o'clock P. M.

President Phillips in the chair.

Mr. C. A. Harrison acting secretary. Roll called. Present: President Phillips, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Fralick, Hyde, Manning, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, McKay, Beckwith, Baxter, and the secretary, who came in late.

Reports of committees called for. No reports.

Superintendents' reports called for; reports all favorable. Viewing Committees report all work done and the books in hands of secretary, except in Departments of Fine Arts and Agriculture.

Treasurer Dean reported receipts for Thursday $10,524.50.

Committee on Special Premiums reported as follows:

The Special Committee appointed to examine the entries and proofs, submitted for special premiums offered by the Michigan Carbon Works, would respectfully report: That there were thirteen entries for these premiums, of these but four presented any proofs, and of these the proofs in one case were voluntarily withdrawn before your committee was appointed, leaving but three entries and proofs for examination. From the fact that no evidence was submitted or required as to nature of soil, previous condition of the land, cost of phosphates used as compared with other fertilizers, and from the further fact that time of seeding, quantity of seed used, and method of sowing varies in each case, the result obtained is not as valuable for practical purposes as it would be under different conditions, still it will probably meet the end sought by the parties offering the premiums. To be of practical value to farmers, experiments should be continued on the same land for at least three years with proper rotation of crops, using on adjoining pieces of land for trial phosphates on one and ordinary fertilizers on the other, with cost of each and comparisons of results.

Your committee would recommend awards as follows:

First premium $75 to J. D. Perry, Redford, Wayne Co., Mich. Entry No. 3; sown with drill Sept. 10th; 1½ bush. of seed to the acre.

Product with phosphate fertilizer per acre	25 41-60	bushels.
“ without “ “ “	13 44-60	“
Gain by use of “ “ “	12 37-60	bushels.

Second Premium $50 to Albert Case, Manchester, Washtenaw Co. Entry No. 5; sown broadcast Sept. 26th; 1¾ bush. seed to the acre.

Product with phosphate fertilizer per acre	18 30-60	bushels.
“ without “ “ “	9 20-60	“
Gain by use of “ “ “	9 10-60	bushels.

Third premium $35 to C. G. Gibbs, Troy, Oakland Co. Entry No. 7; sown with drill Sept. 20th; 2 bush. seed to the acre.

Product with phosphate fertilizer per acre 16 31-60 bushels.
" without " " " 10 17-60 "

Gain by use of " " " 6 14-60 bushels.

W. J. BAXTER.
WM. CHAMBERLAIN,
C. A. HARRISON,
Committee.

Mr. Parsons moved the acceptance and adoption of the report. The motion prevailed.

On motion, the treasurer was instructed to retnru to the Michigan Carbon Works the balance of money received from them and not awarded by the committee.

ELECTION OF OFFICERS.

The judges of election reported as follows:

We hereby certify that the whole number of votes cast was one hundred (100), and they were cast as follows, viz.:

FOR PRESIDENT.

Henry Fralick, Grand Rapids	100

FOR SECRETARY.

Joe C. Sterling, Monroe	100

FOR TREASURER.

A. J. Dean, Adrian	100

FOR MEMBERS OF EXECUTIVE COMMITTEE.

Abel Angel, Bradley	99
D. W. Howard, Pentwater	100
H. O. Hanford, Plymouth	100
F. L. Reed, Olivet	100
A. F. Wood, Mason	100
F. V. Smith, Coldwater	100
J. Q. A. Burrington, Tuscola	100
John Gilbert, Ypsilanti	100
C. A. Harrison, Paw Paw	100
M. P. Anderson, Midland City	100

GEO. W. PHILLIPS, *President.*
M. DORRILL, }
ADOLPH WHEELER, } *Judges.*
SAMUEL F. CONLEY, }
J. B. FROST, *Clerk.*

On motion, the report was adopted.

Report of Viewing Committee in Division D was read, recommending a discretionary premium on Jersey Red hogs. Referred to superintendent of that department.

Superintendent of Division O read his report, recommending a number of discretionary premiums.

It was moved and supported to adopt the report with recommendations.

Mr. Hanford moved to amend by striking out the recommendation of a premium on stone lifter. The amendment was voted.

A vote was then taken on the motion, as amended, and lost.

Mr. Baxter moved a reconsideration of the question. The motion prevailed.

It was then moved an supported to adopt the report, with the recommendation of the superintendent, with the exception of the premium on stone lifter. Carried.

Mr. Butterfield moved that an invitation be extended to District and County Agricultural Societies of Michigan to attend the winter meeting of this society.

Leave being granted, he withdrew the motion.

Meeting adjourned.

J. C. STERLING, *Secretary.*

GEO. W. PHILLIPS, *President.*

HIBBARD HOUSE, JACKSON,
Friday Evening, Sept. 23, 1881.

Meeting of Executive Board called to order at 8 o'clock P. M., President Phillips in the chair. Roll called. Present: President Phillips, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Fralick, Hyde, Manning, Burrington, Wood, Parsons, Chamberlain, Angel, Harrison, Gilbert, Butterfield, McKay, Beckwith, Baxter, Griggs, and the Secretary.

Treasurer Dean reported gate receipts for the week $19,695.50, and that the number of memberships sold would exceed last year's sales.

Superintendent of Division A reported showing awards in his department for regular premiums amounting to $3,016.

The same superintendent then submitted the following supplementary report:

Your superintendent would further report that Mr. John S. Steel, of Anderson, Ohio, had on exhibition a very meritorious herd of Short-horns, and owing to the fact that he arrived too late to make an entry for premiums this herd was not examined as a competing herd. Mr. Steel, at the request of the officers of the Society, consented to place his herd on exhibition, and your superintendent, in view of the circumstances, and of the great merit of the animals composing this herd, recommends that a special premium of $25 be awarded.

I. H. BUTTERFIELD, JR.,
Superintendent.

On motion the report was adopted.

The secretary read a letter from Mayor Thompson, acknowledging the receipt of $500 for the Michigan fire sufferers, and expressing thanks for the same.

A protest entered by Mr. E. Driggs was read. Mr. D. protests against the awards on Messrs. Moore and Kelly's sheep in class 28.

On motion the matter was referred to Superintendent Burrington with a request to take proof and report to the Executive Committee at the winter meeting.

The president reported number of dinner and attendants' tickets distributed to the superintendents during the fair.

Superintendent of Division B reported recommending a discretionary premium of $20 on Jersey Red swine.

Report with recommendation adopted.

Superintendent of Division E reported a large number of discretionary premiums, and recommended their adoption.

Moved and supported to accept and adopt report of superintendent. Carried.

Mr. Parsons, Chairman of Viewing Committee in Division M, submitted the following:

Your committee on examination and awards in Art Department have, as impartially as possible, performed their arduous responsibility. The largely increased number of art specimens on all descriptions of material and in various forms, by local artists scattered over the State, has made the labor unusually onerous; but with this labor comes the most gratifying conviction that largely through the stimulating influence of this Society art in all its varied forms has made progress, and that notwithstanding the small premiums offered as compared with other interests, material or esthetic. The refining influences of the brush, transferring to canvas the marvelous developments of nature in all its varied forms, are taking fast hold of the public mind with most promising future results. Your committee at some future time will take the liberty of making some recommendations in reference to premiums in this interest, which may, perhaps, be changed with credit to the Society and satisfaction to the artist. Respecfully submitted,

PHILO PARSONS,
P. HAYDEN,
H. C. LEWIS,
Committee.

Received and placed on file.

Mr. Parsons then read the following:

Twenty years' constant, active service in behalf of a great public interest benefitting individuals and promoting intelligently the best material progress of a mighty State demands some recognition at the hands of associates and such acknowledgment as our friendly feelings may prompt. The State of Michigan has more than doubled its population and nearly tribled its assessed valuation since our esteemed associate, F. M. Manning, became connected with us in the arduous responsibilities of enlarging and broadening the utilities of this, our cherished institution, and we have great pleasure in expressing our high sense of the value of his services, and our appreciation of the uniform courtesies of his intercourse; therefore,

Resolved, That in retiring from the position he has so long occupied on the Board of Management and on account of advancing years and local consideration, he carries with him the unfeigned respect and esteem of his associates, and their earnest wishes for his health and happiness.

The resolution was adopted by a rising vote.

Report of Superintendent of Division F was read and adopted.

Report of Superintendent of Division K read and adopted.

Superintendents of Division H reported recommending three discretionary premiums.

On motion, the report with recommendations of superintendent was accepted and adopted.

Report of Superintendent Division G was read, recommending several discretionary premiums on articles enumerated in the premium list, and on other articles, without naming amount of premiums.

It was moved and supported that the report, with the recommendations of the superintendent be adopted, with the exception of discretionary premiums recommended on articles enumerated in premium list. Carried.

On motion, the president, treasurer, and secretary were appointed a committee to fix amounts for several premiums recommended by superintendent of Division G, and approved by Executive Committee.

Mr. Parsons offered a protest against the award on butter. The protest was not sustained.

Superintendent of Division J reported a number of discretionary premiums. Report accepted and adopted.

At the request of President Phillips, Mr. Beckwith took the chair.

Superintendent of Division I read his report.

Mr. Phillips moved that a diploma be awarded Rough Bros. for a display of wagons. After a lengthy debate on the question, Mr. Phillips withdrew his motion.

Mr. Chamberlain then renewed the motion, and it was supported.

Mr. Phillips moved to amend by offering a silver medal. The amendment was accepted, and a vote taken on the motion as amended,—which was lost.

Mr. Baxter moved that the second premium of $5.00 awarded to Rough Bros. be changed to a silver medal. Lost.

Superintendent Ball withdrew his recommendation for discretionary premiums, and the report was adopted.

It was then moved to reconsider the vote adopting the report of the Superintendent of Division J. Carried.

Moved and supported that the premium recommended on steam engine be stricken out. Carried.

On motion, the report as amended was adopted.

President Phillips resumed the chair.

Superintendent of Division M reported, recommending several premiums on non-enumerated articles in class 57, and a silver medal to Messrs. Hammond & Co. for display of paper in class 58. On motion, the report was accepted and adopted.

Mr. Cobb reported verbally that everything had passed off smoothly in his department. He gave notice that he would offer an amendment to the rules in classes 18 and 19, at the winter meeting.

Mr. Chamberlain offered the following resolutions:

Resolved, That the magnificent exhibits in nearly all departments of the State Fair of 1881, and the very large attendance of visitors from all parts of the State, furnished gratifying evidence of the progress of the State in the development of its various industries, of the general growth prosperity, and success of our society, and of the appreciation and approval of its management and efforts to advance the great interests committed to its charge;

Resolved, That the society is under many obligations for the interest taken by some of the merchants, manufacturers, artists, and citizens of Jackson, in making exhibits not only creditable to the city but to the entire State, and also in their untireing efforts to provide for the comfortable entertainment of all visitors at the fair, so that of the many thousand in attendance none were without suitable food and comfortable lodgings;

Resolved, That the thanks of the society are due to the members of the various viewing committees, who have devoted so much time to a careful and conscientious discharge of their difficult and delicate duties, and whose awards are, as a rule, accepted by exhibitors as just and satisfactory;

Resolved, That to the press of the city and State and to their reporters and correspondents, we extend our hearty thanks for their kindly notices and reports, and for the general interest they have taken in, and the efforts they have put forth to make our fair a success;

Resolved, That the thanks of the society are due to the Michigan Central and other railroads of the State which have furnished free transportation for stock and machinery to and from the fair, and to the gentlemen representing these roads at Jackson for their hearty co-operation with the officers of the society to furnish every facility for convenience of exhibitors, and for the reduced rate of fare, enabling so many citizens of the State the opportunity of attending their annual State Fair.

Meeting adjourned.

J. C. STERLING, *Secretary*.

GEO. W. PHILLIPS, *President*.

PROCEEDINGS OF THE EXECUTIVE COMMITTEE AT THE ANNUAL WINTER MEETING.

FIRST DAY.

Detroit, January 9, 1882.

The regular annual meeting of the Executive Committee of the Michigan State Agricultural Society was held in the Russell House, Detroit, this evening, President George W. Phillips in the chair.

The roll was called and the following named gentlemen answered to their names: President Phillips, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Fralick, Hyde, Manning, Smith, Wood, Chamberlain, Parsons, Howard, Butterfield, Gilbert, Beckwith, Baxter, and the secretary.

President Phillips then addressed the Society as follows:

ADDRESS OF PRESIDENT PHILLIPS.

Gentlemen of the Executive Committee:

Retiring, as I now do, from the position of President of this Society, and the duties which, in that position, have devolved upon me during the past two years, I gladly commit those responsibilities to other hands. In doing so I desire to say that in view of the importance of those interests we seek to promote, and the hearty co-operation of those associated with me, I have felt those duties to be a pleasure rather than a burden.

It is not very clear to my mind just what should be the scope of a retiring President's address, and so far as my recollection serves me, my predecessors have not all thought alike in regard to this matter. Some of them have taken a large liberty with regard to suggestions and recommendations relating to the future conduct of the Society, while others again have made few if any such suggestions. In the present instance I feel that the latter course best accords with the fitness of things. In view of the ability of the gentleman who succeeds me, and his familiarity with the operations of the Society, I cannot but regard it as unnecessary, if not entirely out of place, for me to suggest plans for his adoption. I regard it as only right and proper to delegate to the President-elect all recommendations affecting the policy of the Society and the efficiency of its operations, as the responsibility for the success of the policy will devolve upon him.

The past year has been one of great industrial and commercial activity. There has been plenty of work and good wages for all who wished to be employed. The agriculturist shared to some extent in the general prosperity, although not so fully as for some years previous. The wheat crop has been exceedingly light and unprofitable, and the drought in most localities seriously injured the other crops. Yet, as is always the case, Michigan has enough to sustain her population, with a large surplus to export to find a market elsewhere. This is one of the many advantages which are the results of the system of mixed husbandry that so generally prevails among the farmers of Michigan. This fact, together with our proximity to three of the largest inland lakes in the world, protecting us from those disastrous droughts from which the States further inland frequently suffer, constitute a natural protection against anything approaching a famine. The system of mixed husbandry is peculiarly well adapted to the location, climate and soil of our State, and should be encouraged. It bears an intimate and important relation also to the varied industries that we desire to establish and build up.

During the past year there have occurred calamities that are not likely to be forgotten. Our sorrow and sympathy have mingled with that of the whole nation—nay, we might say, with the entire civilized world—called forth by the assassination of President Garfield, a man beloved and honored as few if any others have ever been. A great calamity befell our State in the fearful destruction of life and property by fire in the counties of Sanilac, Huron, and part of Tuscola. Much has been done through the considerate kindness and generosity of people in various portions of the country to mitigate the suffering that the loss of property must otherwise have occasioned.

Turning to matters more directly connected with this Society, you are all aware that our custom has been to change the place of holding the State Fair generally every two years, while three years is the most that we have ever held it consecutively in one place, and this was an exception to the rule. Of course there are some things gained by these changes of location, as during a series of years we bring the Fair nearer to the homes of a larger number of people.

The advantages, however, would require to be very great in order to overcome the pecuniary disadvantages, if there is any truth in the old adage, which is as applicable to an organization of this kind as it is to a household, viz., "two removes are as bad as a fire."

In looking over the expenses of the society for a number of years past, I find that the expenses of holding a fair in any given place is much larger for the first year than for the second. This is shown by the amount disbursed under the general classification of "Business Orders." Treasurer's report for 1878 shows that for the first fair at Detroit, the business orders amounted to $28,197.70; while for the two succeeding years it was $19,627.82 and $16,970.44.

The business orders for the last fair, including about $1,500 expenses of the previous year, amount to a little over $17,000, or $11,000 less than the first Detroit fair. This is a good financial showing, in view of the outlay we found it necessary to make on returning with the fair to Jackson. The question of permanently locating the fair at one or more places is one of great importance, and will doubtless have to be decided in the near future. We could thus secure better and more ample accommodations with less outlay than we now have.

During a great part of our history as an organization, there has been nothing between our State society and county societies but cordial feelings. There are now organized three large district agricultural societies in the State, each of them holding an annual fair, the Central, Western, and *Northeastern*. The first of these has its fair located at Lansing, the second at Grand Rapids, while the third may find it desirable to change the place of holding its fair from one to another of the three cities within its district, viz.: Bay City, Saginaw, and Flint. We must regard these district societies as kindred rather than rival organizations, seeking, though in a limited sphere, to do a similar work to that which we are doing ourselves.

I trust that our harmonious and cordial relations with the State Board of Agriculture and the Executive Officers of the State Horticultural Society, may be long continued. I have a growing appreciation of the work of these organizations, and of the faithfulness and ability of the gentlemen to whom that work is committed.

He then introduced the president elect, Mr. Henry Fralick, who addressed the committee as follows:

MR. FRALICK'S ADDRESS.

State Agricultural Society:

In assuming the position of president of this society, I wish to express to you and the members of this association, my thanks for this mark of your and their confidence, and trust that in the discharge of the responsible duties pertaining to the office, I may be so fortunate as to have your hearty co-operation, and merit your approval.

The object of this society is briefly expressed in its organic law, which states that it is for the "improvement of agriculture and its kindred arts throughout the State of Michigan." The words are few, but their meaning is capable of indefinite extension and enlargement, but I will content myself and I trust not to weary you, with a few brief statements and references to its past history, its undoubted great and good influence on the prosperity of the State and its people, a few thoughts on the theories and foundations of our great and valuable work, and a few brief suggestions and recommendations on their practical application.

AGRICULTURE

Is the oldest as well as the most useful industry in the world; without it there can be little or no material progress or prosperity. It is the foundation of all worthy and honorable employment; without it there can be no civilization, no progress, no advancement from the roaming nomad of the desert, or the savage of the forest. We have but to contrast the countries where the agricultural pursuits are but sparsely carried on, with the United States, or any other intelligent people or country, where agriculture is made a principal occupation of a large share of its people. It has been well said the farmer is the only man whose calling is essential to life; the only person for whose immediate and material ends all the forces of nature work without ceasing. Therefore let the intelligent tiller of the soil honor and improve himself, and he will surely be honored and prospered in his calling. While it is generally admitted that agriculture proper, such as raising all of the various direct products of the soil for personal use, and home and foreign markets, the raising of cattle, horses, sheep, swine, poultry, etc. is of very great importance and absolutely essential to all other trades and industries. The language used in our organic law, stating the object of this society, is much broader than the name of the society indicates, and very fortunately and properly its founders and managers conceived and carried out the principle that it really embraces nearly all the industries of the State; therefore, in legislating for its interests, we must endeavor to inclnde all that our organic law fairly construed brings under our jurisdiction.

To be a successful farmer it is essentially necessary to have an agricultural education, which will embrace a thorough knowledge of the soil, its strong and weak points, its best natural productions, the manner of its best and cheapest permanent drainage, the character and kinds of fertilizers the best adapted to the soil he cultivates, of the best kinds and quality of seeds to be used, that they were thoroughly ripened and carefully preserved for use when needed, and the kinds of fruit best adapted to the soil and general character of his farm. Without this knowledge, success cannot be expected, and generally will not be obtained.

STOCK.

Almost every kind of cattle, horses, sheep, swine, and poultry can be successfully and profitably raised in Michigan that are indigenous in the same climate in the United States. But to be a successful stock breeder and raiser of any kind requires, first, a thorough knowledge of the subject, then time, care, good judgment in selections, and close attention to all the material points.

The stock interest of this State has now become so large and valuable that it is entitled to the careful consideration of this committee and the society, and every encouragement must, that consistently can, be given to induce the improvement of our breeds and increase in their numbers and value.

In my judgment one of the most direct and proper methods for this society to foster and promote this important branch of husbandry is to offer the most liberal premiums and awards that the means of the society will permit; then there must be a careful and wise discrimination in favor of the best and most profitable of their kinds of each and as a whole; but to make such selections, and to arrive at just conclusions on so important a matter, great care and good judgment must be exercised in selecting and procuring impartial experts, as near as possible, in every case for judges. That, undoubtedly, would be somewhat difficult to do, but we should approximate as near to it as can be done within our means. The lack of competent, impartial judges in the past, in this and many other departments, has been not only a source of annoyance to the officers of the society, but in some cases a serious injustice and wrong to exhibitors, and a seeming cause of reproach to the society.

I recommend a careful consideration of this subject of judges or committees, premiums and awards, and as far as can be done within reasonable means, apply the remedy where needed.

MANUFACTURES.

The business of manufacturing has already become a very important factor in the problem of the great and permanent prosperity of this State and its people, and is an important element of one of the kindred arts of agriculture. This industry is very valuable; the field is large and much of it yet unoccupied. Every proper encouragement that can consistently be given to its improvement and increase in the State is the duty, and I feel confident will be the pleasure, of this committee and the society. I respectfully recommend that the classes in this department be carefully examined and revised by the Committee on Premiums and Awards, and more liberal offers made on all materials and manufactured articles of general utility and value, as it is very desirable that the production and exhibition of such materials and articles be largely increased.

MACHINERY.

It is very important to increase the home production of all kinds of valuable machinery used in the State, as our manufacturers increase. To be profitable, the best class of machinery must be used. We have plenty of coal, iron, copper, wood, and all the materials necessary to make first-class machinery, and we certainly have sufficient skilled workmen to manufacture it, and yet thousands of dollars are annually sent out of the State to purchase machinery to be used by our people.

This subject should have a careful consideration, and if possible adopt some method to induce the production of all, or nearly all, the machinery required in this State by our own manufacturers, thereby not only saving a large amount of money annually to our own citizens, but foster and promote the education of our own people in this important and indispensable branch of industry.

POMOLOGICAL OR HORTICULTURAL SOCIETY.

This society is a valuable auxiliary to the State Agricultural Society; it has its peculiar work, which has been successfully performed. and so important and thorough has been its work, and the consequent result of its labors, that the whole State has been greatly benefited in the valuable productions of improved fruits, and has received much credit and favorable comment for its thorough educational system and the production and exhibition of the various kinds of fruits raised in the State, in successful competition with the oldest and best fruit growers in the country.

Their work is still making favorable progress; they and it richly deserve, and I feel confident will receive, favorable consideration and generous treatment from this committee and society.

AGRICULTURAL SOCIETY.

The June meetings for the last three years, at the Agricultural College, have been a source of pleasure to the committee, of undoubted gratification to the faculty, and, we trust, profitable to the students; it has enabled our members to examine the practical workings of the college, of the manner and kind of education imparted there; and I feel confident the information sought, collected, and to be promulgated by this society through the annual report of our special committee, will be well received through the State, and will add to its already many friends.

In addition to the other kindred societies it has been our pleasure to meet at Lansing the last three years—and which I am informed are to be continued—will be added this year the State Pioneer Society, which has changed the time of holding its annual meeting from February to the first Wednesday in June, as being a more propitious season of the year for the gathering of the old and labor-worn veterans of the forest. I favor the continuance of these meetings.

The financial condition of this Society is strong and satisfactory; it has now a surplus fund of over $20,000, quite a large share of it invested in United States bonds drawing interest. Its finances have been very satisfactorily managed by our present worthy treasurer, Mr. Dean, for the last ten years; his accounts are always clear, distinct, and properly rendered; all proper claims against the Society are promptly and courteously paid; all vouchers are properly classified, compared, and preserved; the system of procuring, selling, and taking up tickets is safe and well guarded.

While the financial results of the last Fair did not add much to the surplus fund, it still accomplished, in a large measure, the object of the Society. There was a large and very satisfactory exhibition in most all of the important departments; the competition was spirited but harmonious, and the awards generally satisfactory. The attendance at the Fair was very good, and they seemed to give more than usual attention to the merits of the exhibition.

The policy of this Society in conducting its Fairs, making premium lists, etc., is, and I think very properly should be, liberal, but must be firm and decided. Our business and aim is to foster all proper and valuable industries of the State, but that must be done with our legitimate means; the Society must be self-supporting; the premium list should be as large as the safe financial point will permit, but must be wisely discriminating to make successful fairs.

REDUCTION OF EXPENSES.

At the last winter meeting, on the recommendation of the President, a special committee was appointed to devise ways and means for the reduction of the expenses of the Society. After a careful consideration of the subject, they made a report, and recommended a hoped-for reduction, in the various departments, of $3,780, which was adopted by the Executive Committee.

I am confident every reasonable effort was made during the last year by the officers to keep the expenses at the lowest practical point, and yet accommodate the exhibitors and patrons of the Fair.

The result has been a fair reduction in almost every department, and but for the large additional expense of new buildings (which were actually necessary), amounting to $4,800, we should have had a very gratifying reduction in the aggregate, but which is now about the same as for 1880. If the Fair should be held at Jackson this year, the expense for building would undoubtedly be much less.

It is difficult to see where much average retrenchment can be made while the present system of changing the place of holding the Fair so frequently prevails, without some arrangement can be made whereby the Society can reap after benefits from the erection of costly buildings of more or less permanence, used by the Society from one to three years, and then abandoned and virtually lost to the Society; except in a few instances, a very small share of the cost is realized, either from sale or the taking down and again using or selling the materials. Our surplus fund is now large, but a few fairs with unfavorable weather would soon wipe it out; in the days of our prosperity is the time to build wisely. I recommend that this subject be again carefully considered.

FAIR CIRCUIT.

By an agreement between the several agricultural societies included in what is styled the "Fair Circuit," the several fairs were held in regular succeeding weeks, commencing at Columbus, Ohio, August 29; then to Cleveland, Toledo, and then to Jackson, Michigan, Indianapolis and Waterloo, Indiana. From the tone of the proceedings of the meeting held at Toledo, December 1, 1881, which was attended on the part of this Society by Messrs. Philo Parsons and J. M. Sterling of our committee, they all seem to have been pleased with the results, and recommend their continuance. The gentlemen representing this Society at that meeting will undoubtedly make a report at this meeting of what transpired there, for the information of this committee, and such recommendations as in their judgment may seem proper.

It is a little over fifty years since the real settlement of the then Territory, now State, of Michigan, commenced. What was then an almost unbroken wilderness covered with the primitive forests, is now, in most of the important and substantial elements of progress and prosperity, one of the greatest States in the Union. Its production of the great staples of iron, copper, salt, gypsum, lumber, fresh water fisheries, and fruit, equals or exceeds that of any other State both in quality and quantity. The products per acre of the cultivated lands exceed in value (as given by the official reports) that of any other State.

In 1850 the State contained 38,100 farms containing 1,929,100 acres of improved lands. The assessed value of the whole property in the State was $31,000,000; the population was 397,654. In 1880, in thirty years, the number of farms had increased to 118,941, and the number of acres of improved lands to 6,217,209, and the valuation of the property in the State to $810,000,000, and the population to 1,636,331.

This society was organized in 1849. Its progress for a time was slow. The people and State were poor, not only in purse but in the necessary knowledge of agriculture and its kindred arts. But its founders and supporters were men of the right stamp. They adopted "Excelsior" for their motto, and the result is now before the people of the State.

It was the fruitful germ (well cultivated) from which have sprung as auxiliaries and co-educators of our people, no less than thirty county and district agricultural, pomological, and horticultural societies in this State, some embracing as many as fifteen counties; also a large number of farmers' institutes, cattle, horses, sheep, and swine breeders' associations in various parts of the State, and all of which are in a prosperous condition, disseminating valuable information, and at their fairs annually disbursing premiums and awards by the thousands of dollars, and which are attended by tens and twenties of thousands of people.

The members and friends of this society were the first to organize in the United States a successful Agricultural College which is thoroughly practical in its aims and objects. Its classes are taught in the fields as well as in the recitation rooms. No time or attention is given to ancient or foreign languages, but thorough training in the English language and literature is provided for, and especial attention is given to the practical sciences and their application. For example: It at present teaches surveying, levelling, the laying out of grounds, mechanics as applied to implements, building, stock breeding, agricultural chemistry, and horticulture; and experiments for the promotion of agriculture are systematically and continuously prosecuted, and their results are given to the public in the annual reports of the State Board of Agriculture, and in lectures delivered by members of the faculty at farmers' institutes, which are now held annually in all parts of the State, and which have proved of much value to the farmers of Michigan.

The school system proper of Michigan, from the primaries up to the University, we claim is not excelled in any of the States, and equalled by very few; and I feel very confident that in the promotion and improvement of agriculture and its kindred arts, from the Agricultural College, the State Board of Agriculture, the State Agricultural and Horticultural Societies, and the various district and county societies, farmers' institutes, stock breeders' associations, local and State Granges, we will take rank with the best. While so many organizations having the same objects and purposes in view would seem to excite a feeling of strife and contention, so far as is known complete harmony prevails, and a creditable feeling exists of a fair competition and a desire to excel which has a direct tendency to stimulate each person and locality to every proper means to obtain the requisite knowledge to accomplish the object sought, to wit: To so educate themselves and their fellow citizens as to be able to raise or produce the largest, best, and most valuable crops of grain, hay or fruit, or the best and most valuable animal or article of their kind for home use, exhibition, and market.

As before stated, the principal aim and end sought by this society is to obtain and promulgate practical knowledge to the people of the State on the great and important subject of improvement in agriculture and its kindred arts, and the object of these brief statements I have given of what has been and is being done by the society is to encourage its officers, members, and all other co-workers, not only to continue in their arduous, self-denying, but in their results gratifying, labors, but to also interest and thereby enlist new, young, and competent educators to take the field and help push along the work so well commenced, and develop it to a full, complete, and continued success.

On motion of Mr. Baxter the addresses of the outgoing and incoming presidents were accepted and referred to a committee for subdivision of subjects and recommendations.

Messrs. Baxter, Hyde, and Cobb were then appointed such committee.

The secretary's report was then read, accepted, and referred to proper committee.

SECRETARY'S REPORT.

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN,—In conformity to the by-laws, I hereby respectfully report the transactions of the secretary's office during the year just closed.

Four hundred and thirty-seven warrants, amounting to $17,231.74, were issued upon the treasurer for the payment of accounts audited by the Business Committee: of this amount, $1,605.69 was drawn for accounts of 1880. A record of the above orders will be found in the register of accounts for 1881, and upon the stubs of the orders; vouchers corresponding with the orders are on file in the secretary's office.

Four hundred and twenty-five checks, numbered from 1 to 425 inclusive, were drawn on the treasurer for premiums awarded at the 33d annual fair, and amount to $9,809.00. In addition to these, four checks, numbers 661, 662, 663, and 664, amounting to $113, were drawn for premiums on exhibits of 1880, making the total amount of premium checks issued during the year, $9,922.00. A complete list of checks drawn for premiums will be found in the schedule accompanying the report.

The following table will show the amount of cash and number of medals and diplomas offered and awarded in each division:

CASH PREMIUMS.

DIVISION.	Offered.	Awarded.
A—Cattle	$3,728 00	$3,041 00
B—Horses	3,557 00	2,958 00
C—Sheep	1,139 00	1,078 00
D—Swine	556 00	532 00
E—Poultry	354 00	264 00
F—Farm Products	585 00	523 00
G—Dairy Products	304 00	266 00
H—Farm Implements	27 00	8 00
I—Vehicles	215 00	153 00
J—Machinery	415 00	28 00
K—Manufactured Goods	596 00	161 00
L—Musical Goods and Plated Ware	94 00	7 00
M—Art Department	466 00	302 00
N—Needle Work	366 50	241 00
O—Miscellaneous	86 00	72 00
P—Children's Department		15 00
Special Michigan Carbon Works Premium	200 00	160 00
Total	$12,688 00	$9,809 00

MEDALS AND DIPLOMAS.

DIVISION.	MEDALS.		DIPLOMAS.	
	Offered.	Awarded.	Offered.	Awarded.
A—Cattle			7	6
D—Swine			5	5
J—Machinery	9	4	1	
K—Manufacturers	1		1	
L—Musical Instruments and Plated Ware			8	1
M—Painting and Stationery		1		
O—Miscellaneous	3	1		
Total	13	6	22	12

The following is a list of entries in each class and division:

DIVISION A—CATTLE.

Class.	
1—Short-horns	137
2—Devons	28
2—Herefords	58
4—Ayrshires	37
5—Jerseys	67
6—Galloways	16
7—Holsteins	59
8—Grade Cattle	49
9—Working Oxen and Steers	20
10—Fat Cattle	32
11—Herds	32
Total	535

DIVISION B—HORSES.

Class.		
12—Thorough-breds	11	
13—Horses of all work	132	
14—Roadsters	62	
15—Breeders' Stock	88	
15—Gents' Driving Horses to Road Wagon	44	
17—Draught Horses	52	
18—Carriage and Buggy Horses	43	
19—Michigan Horses, Roadsters, and Thorough-breds	16	
20—Michigan Horses, Mares, and Geldings	69	
21—Sweepstakes for Stallions with six of his get	11	
Total		528

DIVISION C—SHEEP.

Class.		
22—Thorough-bred American Merinos	143	
23—Fine Wool Grades	26	
24—Southdowns	51	
25—All Middle Wool Sheep other than Southdowns	46	
26—Leicesters	34	
27—Cotswold and other Long-wooled Sheep	68	
28—Grade Coarse-wooled Ewes	20	
29—Fat Sheep	22	
Total		410

DIVISION D—SWINE.

Class.		
30—Berkshire	31	
Essex	49	
Suffolk and Small Yorkshire	27	
Poland China	22	
Chester White and Large Yorkshire	25	
Fat Hogs	11	
Jersey Red (special)	5	
Total		170

DIVISION E—POULTRY.

Class.		
31—Poultry	258	258

DIVISION F—FARM PRODUCTS.

Class.		
32—Grain and Seeds	151	
33—Roots and Vegetables	430	
34—Flour, Meal, and Feed	28	
Total		609

DIVISION G—DAIRY PRODUCTS.

Class.		
35—Butter, Cheese, and Dairy Articles	50	
36—Sugar, Bread, and Pickles	86	
37—Honey Bees and Bee Fixtures	37	
38—Prepared Groceries, etc	10	
Total		183

DIVISION H—FARM IMPLEMENTS.

Class.	
39—Plows	27
40—Tillage Implements	45
41—Seed Drills, Sowers, Planters, etc	41
42—Haying and Harvesting Implements	93

Class.		
43—Machinery for Preparing Crops for Market	50	
44—Miscellaneous Farm Articles	66	
45—Household Articles	20	
Total		342

DIVISION I—VEHICLES.

Class.		
46—Wagons and Carriages	142	142

DIVISION J—MACHINERY.

Class.		
47—Machinery for Working upon Metals	30	
48—Miscellaneous Machinery	3	
Total		33

DIVISION K—MANUFACTURED GOODS.

Class.		
49—Materials	18	
50—Factory-made Goods	6	
52—Articles of Leather and India Rubber	8	
23—Articles of Furniture	20	
54—Stoves, Iron, and Concrete Work	24	
Total		76

DIVISION L—MUSICAL INSTRUMENTS AND PLATED WARE.

Class.		
55—Musical Instruments	8	
56—Plated Ware	2	
Total		10

DIVISION M—DEPARTMENT OF ART.

Class.		
57—Painting and Sculpture	202	
58—Printing and Stationery	5	
Total		207

DIVISION N—ORNAMENTAL NEEDLE-WORK.

Class.		
60—Plain Needle and Machine Work	105	
61—Embroidery and Ornamental Needle-Work	141	
62—Crochet, Knit and Fancy Work	78	
63—Hair, Shell, and Wax Work	25	
Total		349

DIVISION O—MISCELLANEOUS.

Class.		
64—Miscellaneous Articles	26	26

DIVISION P—CHILDREN'S DEPARTMENT.

Class.		
65—Children's Work	27	27

SPECIAL DEPARTMENT.

Michigan Carbon Works' Premiums	13	13
Total entries in all divisions		3,918

The following is an inventory of property in the secretary's office:

American Short-horn Herd Books	19 vols.
American Jersey Cattle Club Herd Register	7 vols.
American Devon Herd Book	5 vols.
Holstein Herd Book (Vols. 2, 3, and 4)	3 vols.
American Stud Book	3 vols.
Dutch Frieson Herd Book	1 vol.
History of the Short-Horn Cattle	1 vol.
Pedigrees of English Short-Horn Bulls	1 vol.
Vermont Merino Sheep Register	1 vol.
Michigan Farmer for years '45 to '54 inclusive, bound in	8 vols.

Several reports of State Boards of Agriculture of Michigan, Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, Upper Canada, and of the Michigan State Horticultural Society.
1 Office Desk.
1 Old Trunk.
4 Boxes for Books.
1 Society Seal.
1 Postal Scale.
1 Gold Medal.
6 Ink Stands.
1 Pair Shears.

During the year there has been filed in this office articles of association of the "Union Agricultural Society of St. Joseph Valley," "St. Joseph County Agricultural Society," and "The Washtenaw County Agricultural and Horticultural Society."

J. C. STERLING,
Secretary.

Treasurer Dean then submitted his annual report. On motion of Mr. Parsons, the treasurer was instructed to add the premium on government bonds to his annual report. Carried.

It was moved and supported to reconsider the vote. Carried.

After a discussion, the question was called and motion prevailed.

TREASURER'S REPORT.

FAIR HELD AT JACKSON, SEPTEMBER, 1881.

Jan. 11, 1881.	Cash balances on hand at settlement	$22,701 12	
	RECEIPTS DURING THE CURRENT YEAR.		
	From Jackson subscription	$2,000 00	
	From J. M. Sterling, Chairman Business Committee 1880	861 76	
	From unsettled claims	119 67	
	From interest account	395 00	
	From John Gilbert, Chairman Business Committee 1881	3,165 50	
	From sale of membership certificates	832 00	
	From admission to fair-grounds	19,695 50	
			$49,770 55
	DISBURSEMENTS.		
	Paid business orders, 1880	$26 00	
	Paid business orders, 1881	17,231 74	
	Paid premium checks, 1880	123 50	
	Paid premium checks, 1881	9,796 00	
	Paid Horticultural premium checks, 1881	660 50	
Jan. 1882.	Cash on hand, balance account	21,932 81	
			$49,770 55

Of the above balance there is invested in the name of the society, $10,000, face value, in four per cent registered United States bonds, which at the present rate of premium would enhance the actual cash assets of the society, in gross, to $23.632.81.

A. J. DEAN,
Treasurer.

DETROIT, January 9, 1882.

The report was accepted and referred to Finance Committee.

The Business Committee presented their annual report, which was accepted and referred to the Finance Committee without reading. (See Schedule A.)

Messrs. J. M. Sterling and Philo Parsons reported verbally on their visit to the meeting of the Ohio, Michigan, and Indiana Fair Circuit Association.

Mr. Cobb moved that a committee of two, consisting of the President and Secretary, be appointed to confer with like committees from other societies connected with the Fair Circuit. Carried.

The Secretary asked to be excused from serving on the committee, and on motion the Treasurer was substituted.

Mr. Butterfield, Superintendent of Division A, reported as follows:

CATTLE DEPARTMENT.

To the President and Executive Board of the Michigan State Agricultural Society:

I respectfully present the following report of the exhibition in Division A at the annual Fair of 1881:

The total number of entries in this division was 535; of these between 40 and 50 were not exhibited. The stalls provided would hold, by crowding, 400 cattle; these were all filled and 10 new ones were built; one herd was, with the consent of the exhibitor, placed in the old hay barn on the Fair grounds; and a few, owned by Mr. Doney, of Jackson, were kindly taken home and brought on the ground only for exhibition in the ring.

The exhibit was above the average, both in numbers and quality, and was creditable to the cattle breeders of the State. All the Short-horns, Devons, Jerseys, and Holsteins shown for competition were owned in the State. A notable exception in the other classes was the fine herds of Herefords and Polled Angus, owned by Burleigh & Bordwell, of Maine. The entries were divided among the several classes as follows: Class 1, 137; class 2, 28; class 3, 58; class 4, 37; class 5, 67; class 6, 16; class 7, 59; class 8, 49; class 9, 20; class 10, 32; class 11, 32. Short-horns more than double any other breed; Jerseys second, Holsteins third, Herefords fourth.

The total premiums offered in this division are $3,728; the total paid, $3,041, and a few diplomas, distributed as follows among the several classes: Class 1, $455; class 2, $370; class 3, $365; class 4. $307; class 5, $385; class 6, $278; class 7, $415; class 8, $140; class 9, $142; class 10, $170; 11 herds.

I suggest whether it would not be greater encouragement to the smaller breeders if an exhibitor was permitted to receive but one premium for the same age in any class. This certainly is all an exhibitor should be entitled to receive where there is no competition. In granting more than this, we give money without obtaining any corresponding benefit.

I believe that a catalogue of all the stock and articles, giving the location on the ground and a brief description of the entry, would be very desirable both for exhibitors and visitors. Such a catalogue is now issued by the New York State Agricultural Society, and meets with much favor. I am told that the sale of these catalogues to visitors equals the cost of publishing the same.

I recommend that the premiums on grade cows be made equal to those on cows in the pure-bred classes. The title to class 6 should read "Galloway and Angus," and to class 7 "Holstein and Dutch Frieseans." This will avoid disputes which have occurred the past season at one or two fairs.

I also submit that when the entries of cattle equal the number of stalls, that further entries be refused, or that stalls for their accommodation be provided previous to the opening of the fair. Otherwise no benefits are derived from closing the entries for so long a time previous to the fair.

I. H. BUTTERFIELD, JR.,
Superintendent.

It was moved and supported that a committee to receive reports of superintendents and assign the same to standing committees be appointed. Carried.

The report of Mr. Butterfield was then accepted and referred to proper committee.

Mr. Cobb, Superintendent of Division B, asked and was granted further time to make his report.

Mr. Lessiter, Superintendent of Division D, offered the following, which was accepted and referred:

To the President and Executive Committee of the Michigan State Agricultural Society:

In class D (swine), the show was a good one, both as regards quantity and quality, there being 170 entries. The number of entries in each class was as follows: Berkshire, 31; Essex, 49; Suffolk, 27; Poland China, 22; Chester White, 25; Fat Hogs, 11, and Jersey Reds, 5. The last breed, not being classed, was awarded a discretionary premium, as it was claimed by some that professed to know, that they were good specimens of the breed.

I would recommend that the Society be liberal in the premiums offered in the Swine Department, as the Society has no fodder to furnish, and it is attended with, to the exhibitor, a great deal of hard, laborious work to get his exhibits to and from the Fair.

All of which is respectfully submitted.

JOHN LESSITER,
Superintendent.

Mr. Wood, Superintendent of Division O, reported as follows:

To the President and Executive Committee of the State Agricultural Society:

In Division O, class 64 (miscellaneous), there were twenty-six entries made, and $72 awarded. Some articles were entered that did not properly belong to the department, and perhaps others should have been entered that were not. The building and grounds allotted were ample, and not being all needed, it was assigned to exhibits from other departments, so that the building was well filled.

As land drainage by means of sewer pipe and tile is demanding special attention, and no one thing, perhaps, is making so great an improvement in our State, for the capital invested, I would suggest that prizes be offered so as to draw out a good display of draining apparatus, thereby bringing the manufacturers and public together for general information and improvement. I think there might be prizes offered on some more articles instead of leaving awards to be recommended by the committee.

Respectfully submitted,

AMOS F. WOOD,
Superintendent of Miscellaneous Department.

Accepted and referred.

Miss Minnie H. Brow, Superintendent of Divisions N and P, reported as follows:

Gentlemen of the State Agricultural Society:

In making my report for the year 1881, I would call your attention to the very large and full exhibition made in Divisions N and P. This fact was very gratifying to me, as I had anticipated a more meagre display. In Division N the general richness and elegance of the articles, together with those of minor worth, made a difficult task for the various committees; but the ladies who served on these committees were prompt, energetic, and obliging. They were kind enough to use great dispatch in their work, thus enabling me to make my returns and reports to the Secretary at an early day.

The children's department was a gratifying success, both in quality and quantity of articles. The plan suggested at the last annual meeting of the Society, and adopted at the Fair of 1881, consisted of awarding entirely discretionary premiums, as the great variety of articles made it quite impossible to establish any permanent or stated list. This plan gave very general satisfaction to exhibitors. I wish to thank the gentlemen for favors and kindness shown to me during the week of the Fair. I can assure you that your efforts were all fully appreciated.

There are no particular improvements to be suggested that I can see, with the exception of a slight addition to the premium list in class 62. This, however, is not of sufficient importance to warrant any change, unless there should be other alterations necessary. Having the entire care of the department resting upon me, and feeling the responsibility of my position, I would respectfully submit all oversights and mistakes to the indulgence of your honorable body. Again thanking you for all the favors received, and with the wish that the Fair of 1882 may be a success, I am

Very respectfully,
MINNIE H. BROW,
Superintendent.

Accepted and referred.

Mr. Smith, Superintendent of Division K, reported verbally. Report accepted.

Mr. Howard, Superintendent of Division F, offered the following:

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN—The Agricultural Hall was well filled. The number of entries in Division F was 609; the number of entries in each class was as follows: Class 32, 151; class 33, 430; class 34, 28. The total amount of premiums offered in this department was $585. The premiums awarded amounted to $523.

In class 32, first premium on red winter wheat was awarded to A. B. Travis, of Brandon, Mich., being a new variety called Travis's Centennial. The exhibit made by the residents of the vicinity of Mackinaw, in Chippewa county, deserves special notice, for the reason that it tends to show that the soil in the northern part of our State is well adapted to the production, in large and paying crops, of anything and everything that can be grown in the more southerly sections. As an evidence of the fact, I would state that for the best bushel of white winter wheat Jacob Dingman, of Sault Ste. Marie, received first premium; best bushel spring wheat, David Brownreed first premium; second prize M. Howlett, both of Sault Ste. Marie; and although the competition was sharp from other parts of the State, Chippewa county carried away many other first and second premiums.

The exhibit made by Charles Grant, Thornberry, Ont., of grain in the head, received first premium, and David Woodman, of Paw Paw, second premium; both made very creditable displays. Mr. Woodman also made a very fine display of a general collection of grains and grasses as grown in the field; also, 120 inverted glass bottles containing one pint each of the different kinds of grain and seeds, put up and so arranged, with great care, as to make a very fine show.

In class 33 James Mantle was the largest exhibitor, and the display of all kinds of garden vegetables was simply immense--everything known or grown in this latitude was on exhibition, and not in meagre quantities either; and if it had not been for our friend A. F. Wood, Superintendent of the Miscellaneous Department, who gave me a portion of his room, the exhibition of vegetables would necessarily have taken place out doors.

The display in class 34 was full, and the premiums awarded.

I would recommend a first and second premium for a general collection of farm products, both grain and vegetables, grown by exhibitor; also the enlargement of Agricultural Hall for the better accommodation of exhibitors.

All of which is respectfully submitted.
D. W. HOWARD,
Superintendent.

Accepted and referred.

The report of Mr. Manning, Superintendent of Division J, was then read.

To the President and Executive Committee of the State Agricultural Society:

I herewith submit a brief report of Division J—Machinery. The exhibition in this department was fair, but not as large as usual, owing, perhaps, to the large demand of machinery at that time. I would here recommend that the Society give larger premiums, more of them, and first and second premiums on all articles in class 47, as you are all aware that this is a great feature of the exhibition; also that it is a great task to move heavy machinery, and the cost is quite large, while the premiums are so nominal that the inducements are not very great.

Respectfully submitted.
F. M. MANNING,
Superintendent.

Accepted and referred.

Mr. Hanford offered the following report for Division H, which was accepted and referred:

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN—The whole number of entries in Division II at our last Fair was 342. But this does not, by any means, show the extent or character of the exhibition, as a very large number of exhibitors were content simply to buy a membership ticket, and not enter their goods at all. This practice is no doubt owing to the fact that we offer no premiums in our division except in one class.

PLOWS.

The number of entries in Class 39 was 27, made principally by the Gale Manufacturing Co., Albion, Mich., and Woodford & Niles, Detroit, for the Wiard Plow Co. Both of these parties made large exhibits of their line of goods. There was also a fine display made by the Oliver Chilled Plow Co., the South Bend Co., Indiana; the Three Rivers Co., Mich.; the Niles Plow Co., Niles, Mich.; Dodge Plow Co., Kalamazoo, Mich,; the Ann Arbor Manufacturing Co., Ann Arbor, Mich., and Furst & Bradley of Chicago, Ill., together with a number of single articles, the name of the exhibitors of which I did not obtain. Great improvement has been made in the plow in the last fifty years, in fact our *fathers* would hardly recognize the plow to-day, yet the march of improvement goes steadily on from year to year. The farmers of Michigan owe a great deal to whoever invented the chilled plow and made it of practical use. To that idea, in our opinion, is due in a great measure the energy displayed by manufacturers and inventors in giving to us the implement we use to-day. The Oliver Chilled Plow Co., of South Bend, Ind., and Furst & Bradley of Chicago, Ill., each exhibit sulky plows, which are coming into quite general use, and attracted great attention during the fair.

CLASS 40.

The number of entries in this class was 45. Stanley & North, of Birmingham, Mich., exhibited field rollers; Albion Manufacturing Co., Albion, Mich., spring-tooth harrows and cultivators and seeder attachment; Luther & Sumner, Grand Rapids, Mich., ditto; P. P. Mast & Co., Springfield, O., ditto; D. C. & H. C. Reed, Kalamazoo, Mich., ditto; Luther & Sumner, also, cultivator, with seeder; Ann Arbor Manufacturing Co., display of cultivators, not entered; S. S. Allen, Philadelphia, Pa., one horse hoe, not entered; F. & J. Bauman & Co., Kalamazoo, Mich., one sulkey harrow and cultivator, not entered; Lawrence & Chapin, Kalamazoo, Mich., cultivators, not entered. There was also exhibited by Albion Manufacturing Co., Luther & Sumner, and P. P. Mast & Co., each a fine display of corn and fallow cultivators, with all the latest improvements, making altogether a very fine show. There were also shown iron harrows and pulverizing harrows, by Woodford & Niles, Detroit, and smaller implements, by different exhibitors, that made the class very full.

CLASS 41.

Number of entries, 41. The display in this class was very full. The articles shown were all of first-class make, and showed such perfection in the application of mechanical and inventive knowledge that it would seem that we could get nothing more from that source. The articles exhibited were grain drills of the various kinds, broadcast seeders, grass and clover seed sowers, for hand or horse power, ashes and plaster sower, manure cart, pulverizing and spreader combined, fertilizer attachment for drill, corn, and bean planters.

The principal exhibitors were: Albion Manufacturing Co., Albion, Mich., broadcast seeder; P. P. Mast & Co., Springfield, O., broadcast seeder, grain drills, and grass seed sowers; Ludlow, Thomas & Rogers, Springfield, O., fertilizers, grain drills, and grass seed sowers; Empire Drill Co., Jackson, Mich., fertilizers, grain drills, and grass seed sowers; C. R. Taylor, Jackson, Mich., combined broadcast seeder and cultivator, grain drills, and grass seed sowers; Farmers' Friend Manufacturing Co., Dayton, O., fertilizers and grain drills; J. W. Stoddart & Co., Detroit, fertilizers, grain drills, and grass seed sowers; Johnson, Geer & Thurman, Cleveland, O., fertilizers and grain drills; Van Brunt & Davis, Horicon, Wis., grain drills, etc.; Smith & Allshouse, Detroit, grain drills.

There were also exhibited in this class, by F. & J. Bauman, Kalamazoo, Mich., sulky harrow and seeder, seed drills, grass and clover seeders; Blair Brothers, Homer, Mich., grass and clover seeders; I. P. Warner & Co., shoe drills; D. E. McSherry & Co., Dayton, O., fertilizers and plain drill; Wayne Agricultural Co., Richmond, Ind., seed drills, B. S. Williams & Co., Kalamazoo, Mich., combined cultivator and seed drill. These exhibits, together with others that I cannot name, were not entered on our books.

CLASS 42.

Number of enteries in this class, 93, which was probably about half of the machines on exhibition. This is a very important class. On the ease and faculty with which we are enabled to gather our grain and cut and cure our grass, depends our success as farmers in Michigan. We have strong competition in grain and beef production in the neighboring States and territories; we have some advantages over them, and having with them the use of haying and harvesting implements in their perfection, enables us to keep pace with them in their onward road to prosperity. We had all the varieties of mowers, combined mowers and reapers, harvesters, harvesters and binders, one-horse binders, hay tedders, horse hay forks, hay rakes, etc. The exhibit of harvesters and binders has never been equaled in this State, and attracted great attention all through the fair. They have become of practical utility, and are being patronized throughout the grain-growing sections of country.

CLASS 43.

Entries in this class 50. There were in this class a large number of exhibitors that did not show themselves to the entry clerk. The class was very full. To show a comparison of entries to exhibits, there were nine entries of engines, and on exhibition 30. This would hold good in nearly every division of the class. The traction engines elicited great praise from the visitors, for the perfection with which they were handled. There was an equally large show of threshing machines and clover hullers, and combined threshers and hullers, enabling one machine to do the work of two formerly. The whole exhibit in this class was very fine and a credit to the society and exhibitors.

CLASS 44—MISCELLANEOUS FARM ARTICLES.

Number of entries in this class 66, mostly of the non-enumerated class. The exhibit was a very good one, though greatly scattered. Withington & Cooley, of Jackson, Mich., made a very fine display of farm and garden tools in the main hall, also a variety of wheel-barrows. The Battle Creek Machine Co. had their usual display of drag sawing machines for horse and steam power. Smith & Woodward, Kalamazoo, a direct draught horse power. Portable circular saw-mills were shown by Birdsell, Ellis & Co., Penn Yan, N. Y., and Morton Valve Co., Romeo, Mich. Road machine by Pennock & Sons, Pa., and George H. Waldo, Detroit. A variety of fruit ladders, horse pokes and other articles by C. R. Taylor, Jackson. Wind mills and wind engines, and perhaps some gas machines were running in great variety and success all over the grounds.

CLASS 45—HOUSEHOLD ARTICLES.

In this class there were 20 entries, consisting of washing and wringing machines, carpet sweepers, cuff and collar irons and board, etc. As there was a committee appointed to award premiums in this class, perhaps it will be sufficient to say that the exhibit was a creditable one, and attracted great attention from lady visitors.

In conclusion, we would report that the exhibition as a whole was a success in all the classes, fully justifying the wisdom of the Executive Committee in throwing off premiums in this department, but would recommend that the superintendents be empowered at their discretion to appoint a committee to report the merits of the exhibition.

H. O. HANFORD,
ABEL ANGEL,
Superintendents.

Superintendent of Division I was granted further time to report.

Superintendent of Forage was also granted additional time to report.

The president announced as Committee on Distribution of Superintendents' Reports Messrs. Ball, Butterfield, and Chamberlain.

General Superintendent Beckwith made a verbal report, which was accepted.

The president then appointed as Committee on Premiums, William Chamberlain, H. O. Hanford, I. H. Butterfield, Jr., A. O. Hyde, D. W. Howard, and A. F. Wood.

Mr. Parsons moved that the sessions of this committee open at 9 o'clock A.

M. and continue until 6 P. M., with the usual intermission for dinner, and that no evening sessions be held.

The motion prevailed.

On motion, the meeting adjourned till Tuesday at 9 A. M.

SCHEDULE A.

STATEMENT OF BUSINESS COMMITTEE IN DETAIL.

EXPENSE WINTER MEETING.

1881.	*Order No.*		
Jan. 13,	387	Smith and Hurd, Board of Committee	$95 77
	389	Knapp & Smith, omnibus to and from prison	5 00
	390	Clark & Co., Board of Committee	64 50
	391	C. A. Harrison, expenses	4 50
	392	A. F. Wood, "	1 30
	393	C. W. Greene, "	5 50
	394	Philo Parsons, "	2 30
	395	W. G. Beckwith, "	5 50
	396	I. H. Butterfield, Jr., "	8 00
	397	Geo. W. Phillips, "	8 20
	398	Henry Fralick, "	4 30
	399	Wm. Chamberlain, "	5 55
	400	W. H. Cobb, "	2 00
	401	John Gilbert. "	1 40
	402	A. O. Hyde, "	95
	403	J. Q. A. Burrington, "	8 50
	404	Abel Angel, "	4 75
	405	E. W. Rising, "	6 75
	406	D. W. Howard, "	9 95
	407	F. M. Manning, "	66
	408	F. V. Smith, "	3 00
	409	Wm. Ball, "	2 00
	410	H O. Hanford, "	3 40
	411	Chas. Kipp, "	3 20
	412	A. J. Dean, "	2 55
	413	J. M. Sterling, "	4 20
	414	J. C. Sterling, "	4 60
Mar. 1,	3	J. C. Sterling, express on proceedings	2 00
April 1,	8	Times and Expositor for printing proceedings	105 00
		Total	$375 33

PRESIDENT'S OFFICE.

Nov. 10,	301	Geo. W. Phillips, clerk hire	$12 40
	302	Geo. W. Phillips, personal expenses	10 34
	309	Hurd House, board of president	18 00
		Total	$40 74

TREASURER'S OFFICE.

1881.	*Order No.*		
Jan. 13,	381	A. J. Dean, expense of office	$13 41
	385	Chas. Humphrey, stationery	1 20
June 14,	60	A. J. Dean, check stamps	5 00
Nov. 10,	297	Morris Knapp, cartage on baggage	18 00
	299	Telegraph Office, telegraphing	1 00
	311	Hibbard House, board treasurer and assistants	47 00
	312	Lucy Shipman, board of clerks	$33 62
	313	Adrian postmaster, envelopes	3 24
	314	Treasurer's clerks, clerk hire	152 50
	358	A. J. Dean, clerk hire	400 00
	360	A. J. Dean, sundry bills paid	8 47
		Total	$683 44

SECRETARY'S OFFICE.

Jan. 13,	382	J. C. Sterling, salary as secretary *pro tem*	$194 43
	415	E. M. Sterling, writing up records of '78 and '79	25 00
April 1,	20	J. C. Sterling, secretary's salary, 3 months	250 00
June 2,	47	F. Williams & Co., letter balance and files	4 40
July 21,	83	J. C. Sterling, secretary's salary, 3 months	250 00
Oct. 12,	210	Thos. J. Conely, ass't sec'y	21 30
	211	J. E. Landon, "	21 10
	212	H. M. Murphy, "	18 00
	213	F. Livermore, "	18 00
	214	M. S. Wolcott, "	18 00
	215	C. F. Bates, "	16 00
	216	Robert Rilley, "	16 00
	217	Chas Little, "	16 00
	218	C. Sevenberg, "	14 30
	219	J. B. Frost, "	10 00
	220	J. Hanford, "	8 30
	221	W. S. Gridley, "	8 00
27,	262	J. C. Sterling, secretary's salary, 3 months	250 00
	265	Brown & Pilcher, stationery	4 15
Nov. 8,	273	Hurd House, board, C. Little, assistant sec'y	17 00
	274	Hurd House, board, Landon and Bates, ass't sec's	40 50
	275	Hurd House, board, sec'y	41 50
	276	Miss Lucy Shipman, board Hanford and Sevenberg, assistant secretaries	21 00
10,	370	J. M. Sterling, rent of office, one year	50 00
		Total	$1,332 98

BUILDING.

(HARDWARE, LABOR, GLASS, PAINT, ETC.)

June 29,	68	Pay roll labor	$33 87
	69	Pay roll labor	67 25
July 8,	71	Buhl Sons & Co., hardware	35 75
	74	Pay roll labor	123 44
	76	John Gilbert, pay roll labor	12 25

1881.		*Order No.*		
July	8,	77	Pay roll labor	$125 00
	15,	79	Pay roll labor	70 37
	28,	85	Pay roll labor	119 88
	30,	89	Pay roll labor	118 75
Aug.	9,	90	A. Kenny's expenses	6 18
		92	Pay roll labor	122 76
		94	Ducharme, Fletcher & Co., hardware	30 00
		95	Dean, Godfrey & Co., glass	26 40
		96	Pay roll labor	106 63
	25,	107	Pay roll labor	115 25
		108	R. E. Emmons & Co., teams and labor	25 50
		109	Wells & Fuller, hardware	50 97
Sept.	7,	110	Detroit White Lead Works paint	16 25
		113	Pay roll labor	136 98
		114	Parsons Bros., glass and sash	16 00
		115	H. W. Johns Mfg. Co., asbestos roofing	92 50
		116	G. S. Wormer & Son, two pairs gas tongs	4 00
		120	Pay roll labor	160 75
		121	Pay roll labor	38 40
		122	Pay roll labor	147 13
	24,	126	Barnes Bros., four rolls tar paper	4 46
		130	Detroit White Lead Works paint	16 25
		131	Pay roll labor	210 17
		134	E. T. Barnum, wire for chicken coops	38 90
		140	Pay roll labor	256 25
		141	R. S. Bostwick, bill for iron furnace, etc	102 48
		144	Wm Winchester, tar	8 50
		150	Sanford & Co., labor in Mr Hanford's department	10 00
		151	J. E. Woodruff, repairing and blacksmithing	11 00
		153	Pay roll labor	22 50
Oct.	6,	168	Hitchcock, Clark & Co., 300 chicken coops	15 25
	28,	173	Smith Bros., lime and plaster	15 25
		174	H. D. Edwards & Co., one belt	30 16
		186	J. H. Harvey, material and labor	11 00
		187	James Abraham, calcimining Art Hall	3 00
Nov.	3,	191	T. Bennett, 10 M. brick	70 00
		194	Pay roll labor	138 99
		195	Jackson Foundry, foundation for engine	27 67
	12,	225	Wells & Fuller, hardware	22 41
		234	J. D. Woodruff, bolts, etc.	4 50
	15,	240	Pratt & Wright, hardware	117 69
		241	Mills, Heyser & Co., lumber	101 09
		242	Pay roll labor	71 00
		243	C. C. Pond, lumber	67 87
		248	Pay roll labor	18 87
		250	A. Kenny, personal exp'se	8 13
		251	S. Heyser & Son, lumber	5 76
		253	A. Kenney, board	4 50
		257	O. E. Thompson, paint	6 05
Nov.	10,	295	C. C. Pond, lumber and glass	3 40
	10,	296	McConnell & Smalley, lock ticket offices	65
			Total	$3,226 19

LUMBER.

July	15,	80	A. W. Wright, 90M shingles @$1.95	$175 50
	21,	81	A. W. Wright, car load 2x4 and 2x6, @$10	120 75
		82	A. W. Wright, 11,429 feet boards, @$9	102 86
	30,	88	A. W. Wright, 3,392 feet 2x4, @$10, 7,500 feet boards @$9	101 42
Aug.	9,	93	A. W. Wright, 2 cars lumber	$232 02
Sept.	7,	111	A. W. Wright, 3 cars lumber	245 44
		112	A. W. Wright, 1 car lumber	92 67
	24,	133	A. W. Wright, 4 cars lumber	389 04
		152	A. W. Wright, 2 cars lumber	137 13
			Total	$1,596 83

WATER.

Sept.	7,	178	B. Porter & Son, labor	$15 51
		123	Ducharme, Fletcher & Co, gas pipe	66 13
	24,	128	Ducharme, Fletcher & Co, gas pipe	34 04
		132	B. Porter & Son, labor	1 20
		142	Ducharme, Fletcher & Co, gas pipe	23 46
Oct.	6,	165	Lindemer Bros., gas pipe and fixtures	5 43
	12,	228	J. D. Price, use of pipe	9 34
		246	Ducharme, Fletcher & Co, stop cocks, etc	29 09
			Total	$184 20

PRINTING.

Jan.	13,	379	Johnstone & Gibbons, printing programmes	25 00
		386	Times & Expositor, printing dinner tickets	9 00
June	2,	43	Post and Tribune, advertising for prem. list bids.	3 00
		46	Tri-State Fair Association, circuit posters	6 25
	27,	64	Free Press, advertising for premium list bids	6 00
Oct.	12,	202	F. D. Hamilton, printing pay rolls, etc	27 00
Nov.	10,	279	Detroit Free Press, printing programmes, etc	65 00
		280	O. S. Gridley, Benham & Co., m'bership certific's	8 50
		281	W. H. Thompson, posters	79 00
		290	Adrian postoffice, stamps	5 00
		292	Carlton & Van Antwerp, sundry printing	46 25
		319	Jas. O'Donnell, programmes, etc	65 25
		320	O. S. Gulley, Bornman & Co, tickets and badges	55 70
		324	Times and Expositor, note heads, tickets, etc	29 50
		326	Times and Expositor, premium list	202 50
		350	C. F. Payne, entry books	21 25
		352	Calvert Lithograph Co., Comp. tickets	25 00
		355	C. Humphrey, envelopes	2 75
		354	Johnstone & Gibbons—printing awards	75 00
		359	A. J. Dean, pers. expenses	33 91
		373	J. C. Sterling, expenses to Detroit and Adrian	8 95
		374	F. C. Bates, posting and distributing posters	12 00
			Total	$811 81

TAKING DOWN BUILDINGS (DETROIT).

June	21,	22	F. W. Cleveland, labor	$27 60
		23	J. M. Sterling, expenses to and at Detroit	9 50
		24	Mary Bickford, keeping lumber account	10 00
		25	Mrs. Mary Bickford, board of men and committee	7 25
		26	Wm. Bickford, labor pay roll	236 06
	13,	59	Wm. Bickford, labor and expenses	12 10
	27,	63	Wm. Bickford, labor pay roll	59 10

1881.		*Order No.*		
June	27,	65	Mrs. Mary Bickford, board of men	$3 03
July	11,	78	Wm. Stoner, labor	15 00
			Total	$379 64

POSTAGE.

Feb.	1,	2	Postmaster, stamps for reports winter meeting	$6 00
March	1,	4	Postmaster, stamps for Secretary's office	10 00
June	2,	40	F. D. Hamilton, 500 postal cards for Secretary	6 25
July	8,	70	C. Spencer, postage for business committee	5 98
Aug.	12,	100	Monroe postmaster—stamps for comp tickets	15 00
		101	Monroe postm'r, stamps for premium list	15 00
		102	Monroe postm'r, stamps for Secretary's office	10 00
Oct.	12,	206	Monroe postm'r, stamps for Secretary's office	11 00
		207	Monroe postm'r, stamps for posters	8 00
	27,	261	C. Spencer, postage business committee	3 00
		264	Monroe postm'r, stamps for premium checks	12 00
Nov.	10,	349	Adrian postm'r, stamps for Treasurer's office	16 30
		372	Monroe postm'r, stamps for Secretary's office	10 00
			Total	$128 53

BOND PREMIUM.

Jan.	13,	388	A. J. Dean, premium on government bonds	$690 00
June	2,	45	A. J. Dean, premium on government bonds	77 50
			Total	$767 50

LOCATING COMMITTEE.

April	1,	7	Smith & Hurd, board of committee	$8 00
		10	Wm. Ball, expenses	3 00
		11	Wm. H. Cobb, expenses	4 00
		12	F. V. Smith, expenses	2 70
		13	John Gilbert, expenses	4 90
		14	J. M. Sterling, expenses	14 20
		15	A. O. Hyde, expenses	1 45
		16	A. J. Dean, expenses	1 35
		17	Geo. W. Phillips, expenses	4 00
		18	J. C. Sterling, expenses	3 75
		19	Hibbard House, board of committee	35 50
			Total	$82 85

RENT OF GROUNDS (DETROIT).

Jan.	13,	383	L. T. Griffin, rent of lot, 1881	100 00
June	3,	54	Cass estate, rent of fair grounds at Detroit to March 1st, 1881	400 00
			Total	$500 00

LANSING MEETING.

June	1,	27	J. M. Sterling, expenses	$6 85
		29	H. O. Hanford, “	5 05
		30	F. M. Manning, “	2 20
		31	John Lessiter, “	6 50
		32	E. W. Rising, “	4 00
		33	I. H. Butterfield, jr, “	7 50
		34	W. H. Cobb, “	8 70
		35	G. W. Phillips, “	4 20
		36	C. A. Harrison, “	7 20
		37	J. Q. A. Burrington, “	6 50
		38	D. W. Howard, “	11 40
		39	W. Chamberlain, “	11 30
		40	A. F. Wood, “	95
June	1,	41	W. G. Beckwith, expenses	$7 90
		42	Henry Fralick, “	6 40
	3,	52	Hudson House, board of committee	43 50
		55	Philo Parsons, expenses	8 80
	14,	61	A. J. Dean, Treas., “	4 55
		62	J. C. Sterling, Sec., “	5 25
Nov.	10,	288	H. O. Hanford, expenses as member committee attending Agricultural College Farm	5 80
		289	W. G. Beckwith, expenses as member committee attending Agricultural College Farm	14 10
			Total	$178 70

GENERAL EXPENSES.

Jan.	13,	380	G. W. Greene, expense to St. Louis Fair	$39 90
		384	Geo F. Payne, record book	9 00
Feb.	1,	1	William Stoner, care of grounds 1 month, Detroit	30 00
March	1,	5	William Stoner, care of grounds 1 month, Detroit	30 00
April	1,	6	I. H. Butterfield, Jr., expenses of delegate to meeting of Agricultural Society	9 95
	9,	9	William Stoner, care of grounds 1 month, Detroit	30 00
May	10,	21	William Stoner, care of grounds 1 month, Detroit	30 00
June	1,	28	Detroit Water Works, water tax	21 25
	2,	44	Detroit Steel and Iron Works, fixing seal	1 50
	3,	53	J. C. Sterling, expenses to Port Huron	6 90
	10,	56	Jackson Patriot and Citizen, 4 months' subscription	6 80
Sept.	7,	119	James O'Donnell, 100 Citizens	5 00
June	29,	67	Jackson City Bank, check stamps	2 00
Sept.	24,	125	C. L. Palmer, work on grounds	5 00
		135	M. W. Robinson, 25 yards cambric @8c	2 00
Oct.	6,	158	W. S. Chandler, supplies	9 00
		160	Jackson City Ice Co., Ice	2 80
Oct.	6,	159	H. N. Bliler, rebate on swing	$12 50
		161	Mrs. R. F. Altwago, lost umbrella	2 50
		162	C. Nickillson, money paid Mrs. Derby	5 00
		166	Indian woman, lost property	16 50
		171	Frank Havens, use of paint brush	1 00
	28,	182	J. B. Frost, clerk of election	2 00
	3,	198	American Express Co., express on grapes	95
	12,	209	Dickinson, Detroit, blacksmithing	2 75
		226	C. E. Webb, oil, etc	15 60
		230	Elliot & Benham, hay and oats	8 40
		231	R. D. Bullock, rent and cartage of chairs	7 50
		232	Philip Reese, plans of buildings	5 00
		233	Knapp & Simmons, two tables	4 50
		236	Jackson City Bank, check book	4 00
Nov.	8,	277	John Gilbert, telegraph expenses, etc	36 97
	10,	103	William Ball, expenses at Jackson	5 40
		104	J. M. Sterling, expenses at Jackson	5 50

1881.	*Order No.*		
Nov. 10,	105	Geo. W. Phillips, expenses at Jackson	$8 20
	106	W. H. Cobb, expenses at Jackson	15 20
	283	G W. Grigg, personal expenses	4 55
	284	Russell House, board of committee men	10 50
	287	Allan, Sheldon & Co., ribbons and badges	17 02
	308	Hibbard House, board	9 00
	309	Hurd House, board ex-president	12 00
	325	Adolph Wheeler, inspector of election	2 50
	354	Newcomb, Endicott & Co., ribbon	3 30
	357	A. J. Dean, personal expenses	33 24
	364	A J. Dean, treas., expense of meeting at Monroe	33 90
	365	W. H. Cobb, expense of meeting at Jackson	4 50
	366	J. C. Sterling, expenses attend'g sundry meet'gs	16 04
	371	W. U. Telegraph Comp'y, telegraphing	4 42
22,	375	E. D. Winnie, detective services	60 00
Sept. 24,	124	W. G. Thompson, Fire Relief of Michigan	500 00
		Fargo & Mitchell, Chariots	500 00
		Total	$1,611 54

STATIONERY.

June 2,	48	Democrat office, letter-heads, etc., for committee	$33 25
	50	Cornwells, Price & Co., envelopes	8 30
29,	46	S. B. Lemley, stationery for business committee	1 10
Oct. 12,	201	Isaac Lewis, stationery for secretary's office	11 03
27,	263	Democrat Printing Co., blanks, tags, etc	49 25
Dec. 27,	377	Brown & Pitcher, ink, etc	1 70
		Total	$104 63

FREIGHT.

June 10,	57	M. C. Railroad, 11 cars from Detroit	$55 00
	58	M. C Railroad, 2 cars from Detroit	10 00
July 8,	72	M. C Railroad, transportation on hardware	1 34
30,	86	M. C. Railroad, transportation on lumber	45 07
Aug. 9,	99	M C. Railroad, transportation on lumber	28 27
Sept. 24,	127	M. C. Railroad, sundry freight bills	41 07
	137	M. C. Railroad, sundry freight bills	49 27
Oct. 12,	222	M. C. Railroad, sundry freight bills	37 38
		Total	$267 40

EXPRESS.

June 3,	51	U. S. Express Co., sundry charges	$1 75
Nov. 10,	351	U. S. Express Co., sundry charges	7 05
	367	U. S. Express Co., sundry charges	10 77
		Total	$19 57

HOTELS AND BOARD.

1881.	*Order No.*		
July 8,	73	Mrs. Penny, boarding A. Kenny	$5 90
July 28,	84	Mrs. Penny boarding A. Kenny	$7 00
30,	87	Mrs. Penny, boarding A. Kenny	3 50
Aug. 9,	91	Mrs. Penny, boarding A. Kenny	3 50
	97	Mrs. Penny, boarding A. Kenny	3 50
Sept. 7,	117	Mrs. Penny, boarding A. Kenny	10 50
Oct. 3,	196	Mrs. Penny, boarding A. Kenny	14 00
15,	245	Hurd House, boarding committee	31 50
27,	258	Clark & Co., boarding committee	61 10
Nov. 10,	278	Russell House, boarding committee	7 25
	285	Russell House, boarding secretary and treasurer	3 25
		Hurd House, boarding Mr. Gibbons	11 50
		Total	$162 50

BUSINESS COMMITTEE.

July 8,	75	John Gilbert, personal expenses	$10 81
Aug. 9,	98	John Gilbert, personal expenses	8 64
Oct. 15,	247	Morris Knapp, livery for committee	27 00
Nov. 10,	369	W. H. Gilbert, clerk business committee, renting and collecting booth moneys, etc	150 00
		Total	$196 45

HORTICULTURAL SOCIETY.

Sept. 24,	138	State Hort. Society, expenses of society	$1,000 00
Oct. 1,	189	State Hort. Society, expense of decorating	36 64
		Total	$1,036 64

DECORATING.

Sept. 24,	129	Kingsley & Burghoffer, 300 yards garlands	$21 00
Oct. 3,	197	L. H. Field, 50 yards black cambric	6 25
12,	235	Camp, Morrill & Camp, cotton and prints	4 33
	237	W. T. Thornton, cotton for signs	3 60
15,	252	W. H. Gilbert, three evergreen trees	5 00
27,	260	William Bennett & Son, prints	6 48
		Total	$46 64

GROUNDS.

Sept. 24,	136	R. E. Emmons, teams and labor	$45 00
	157	Pay roll labor	13 50
Oct. 3,	193	R. E. Emmons, teams and labor	66 50
	200	Alex. Brown, labor	5 00
12,	223	R. E. Emmons, teams and labor	32 50
		Total	$162 50

POWER.

Oct. 6,	169	Mich. Mnf'g Co., engines in Mr. Hanford's dep't	$90 00
10,	190	Atlas Engine Works, use of engine	200 00
12	239	George Gould, drawing wood to car	2 25
15,	249	S. L. Shaw, fuel	17 50

1881.	*Order No.*		
Oct. 15.	256	Edward McPherson, 60 ft. shafting	$72 50
17.	259	R. E. Emmons, hauling engine	10 00
Nov. 22,	376	M. C. Railroad, repairs on boiler	26 04
		Total	$418 29

BILL POSTING.

Oct. 12,	203	Goodwin & Henry, posting, Detroit	$6 00
	204	G. W. Stevenson, posting, Jackson	2 20
	205	G. W. Bowsley, posting, Monroe	1 40
Nov. 10,	353	Chas. Van Ostrando, posting, Adrian	1 20
		Total	$10 80

MUSIC.

Oct. 6,	163	W. L. Chandler band	$30 00
	164	H. F. Mills, orchestra	60 00
		Total	$90 00

MEDALS AND DIPLOMAS.

Nov. 10,	282	U. S. Mint, 5 silver medals	$22 50
	368	Ira Mayhew, writing 12 diplomas and 20 wrappers	4 20
Dec. 27,	379	M. S. Smith & Co., engraving medals	9 00
		Total	$35 70

FORAGE.

Nov. 10,	266	E. W. Rising, personal expenses	$18 50
	267	E. W. Rising, superintendent's expenses	17 25
	268	E. W. Rising, superintendent's help pay-roll	75 50
	270	Frederick Lewis, hay	349 54
	271	Frank Maynard, hay and straw	503 75
	303	Hurd House, board of superintendent	10 00
		Total	$974 54

GATES AND GATE KEEPERS.

Nov. 10,	308	Hibbard House, board superintendents	$13 50
	317	Miss Lucy Shipman, board gate keepers	33 00
	322	P. Perkins, board gate men	12 38
	321	Hurd House, board gate men	5 50
	344	Henry Fralick, superintendent's expenses	5 80
	363	Gate keepers' pay roll	115 50
		Total	$185 68

LUNCH ROOM AND LADIES' WAITING ROOM.

Oct. 3,	143	A. Strong, 6 quarts milk	36
Sept. 14,	156	P. Fisher, bakers' bill	8 00
Oct. 28,	175	Hull Bros., groceries	65 29
	179	James Gibson, bread	2 00
	184	W. H. Cobb, 2 crocks butter	17 78
1,	188	Mrs. Higgins, cooking	34 67
3,	192	Mrs. Stoner, labor, self and daughter	24 00
12,	224	Pay roll, labor	28 40
	227	W. W. Robinson, towels, etc	11 64
	229	J. H. Wortley, use dishes and one-half doz. lamps	8 58
15,	244	Chas. McCormick, meat	33 63
10,	310	J. M. Sterling, 6 baskets grapes	4 80
		Total	$239 15

MEAL TICKETS.

1881.	*Order No.*		
Sept. 24,	145	Mrs. S. Hoyt, 22 meal tickets	$7 33
	146	First Methodist Church, 108 meal tickets	36 00
	147	Catholic Church, 30 meal tickets	10 00
Oct. 6,	167	C. C. Chapman, 8 meal tickets	2 66
28,	170	Baptist Church, Napoleon, 22 meal tickets	7 33
	172	Daniel Osborn, 3 meal tickets	1 00
	176	M. E. Church, Napoleon, 21 meal tickets	7 00
	177	George Hough, 11 meal tickets	3 66
	178	Baptist Church, 190 meal tickets	63 33
	180	M. E. Church, 18 meal tickets	6 00
Oct. 6,	181	J. M. Seward, 12 meal tickets	$4 00
	183	N. H. Eckler, 8 meal tickets	2 00
3,	199	Daughters Rebekah, 2 meal tickets	66
12,	238	N. H. Eckler, 7 meal tickets	2 33
15,	255	W. S. Chandler, 5 meal tickets	2 50
		Total	$156 46

CHILDREN'S AND NEEDLEWORK DEPARTMENT.

Sept. 24,	146	Edward Davison, labor	$7 00
Nov. 10,	269	Minnie Brow, Supt's expenses and help	7 76
	361	Minnie Brow, Superintendent's board	22 00
		Total	$36 76

HORSE DEPARTMENT.

Sept. 24,	146	Peter Standish, use of stalls	$1 50
Oct. 28,	185	W. H. Cobb, superintendent's expenses	17 75
15,	254	C. C. Pond, use of stalls	4 00
Nov. 10,	291	Hibbard House, board superintendents, judges, and assistants	85 00
	298	Morris Knapp, board of horses	6 00
	300	Morris Knapp, livery	30 00
	318	Hibbard House, board of judges	5 50
	337	W. H. Cobb, Judges' board, etc	59 00
		Total	$208 75

POLICE.

Sept. 24,	154	J. M. Sterling, supt's expenses	$9 10
	155	W. P. Sterling, supt's help	4 65
Nov. 10,	307	Pay roll sundry police	289 00
	337	Thomas Barber, night watch	20 00
Dec. 22,	378	Hurd House, board W. P. Sterling	7 00
		Total	$329 75

TRANSPORTATION COMMITTEE.

Oct. 12,	208	Morris Knapp, livery for committee	$7 00
Nov. 10,	315	Hurd House, board chairman	10 00
		Total	$17 00

MANUFACTURERS' DEPARTMENT.

1881.	*Order No.*		
Nov. 10,	294	Hibbard House, board Superintendent Smith	$16 50
	323	Allen J. Pratt, ass't sup't.	13 20
	341	F. V. Smith, superintendent's expenses	9 25
		Total	$38 95

CATTLE DEPARTMENT.

Nov. 10,	293	H. C. Merideth, judge on cattle	$12 00
	333	Ira H. Butterfield, Jr., superintendent's board	15 00
	340	W. H. Markham, judges' expenses	25 00
	342	Ira H. Butterfield, Jr., superintendent's expenses	13 20
	343	Ira H. Butterfield, Jr., judges' expenses	6 00
	345	Ira H. Butterfield, Jr., assistant sup't	14 40
	448	Ira H. Butterfield, Jr., supt's expenses	6 40
		Total	$92 00

SWINE DEPARTMENT.

Nov. 10,	334	John Lessiter, board of superintendent	$15 00

SHEEP DEPARTMENT.

Nov. 10,	330	J. Q. A. Burrington, supt's expenses	$10 45

MISCELLANEOUS DEPARTMENT.

Nov. 10,	304	A. F. Wood, superintendent's expenses	$4 00
	309	Hurd House, board superintendent	14 00
		Total	$18 00

CARRIAGE DEPARTMENT.

Nov. 10,	303	William Ball, expenses sup't during fair	$6 75
	308	Hibbard House, board superintendent	14 00
		Total	$20 75

AGRICULTURAL DEPARTMENT.

Nov. 10	362	D. W. Howard, superintendent's expenses	$23 31

ART DEPARTMENT.

Nov. 10,	305	Wm. Chamberlain, superintendent's expenses with board	$35 77
	306	Hibbard House, board superintendent	15 00
	327	A. J. Brow, board and expenses Gale collection	68 06
	328	J. C. Burton, insurance on pictures	20 00
	329	C. A. Harrison, expenses sup't	6 05
		Total	$144 86

MARSHAL'S DEPARTMENT.

Nov. 10,	372	A. O Hyde, expenses and board of marshal and assistants	$101 36

POULTRY DEPARTMENT.

Nov. 10,	306	David Jones, judges' expenses	$10 00
	309	Hurd House, board of superintendent	16 50
	336	John McKay, superintendent's expenses	26 55
		Total	$53 05

IMPLEMENT DEPARTMENT.

1881.	*Order No.*		
Nov. 10,	308	Hibbard House, board of superintendent	$20 50
	316	Hurd House, board sup't	1 50
	331	Abel Angel, Superintendent's expenses	6 90
	346	H. O. Hanford, superintendent's expenses	24 80
		Total	$53 70

MACHINERY DEPARTMENT.

Nov. 10,	308	Hibbard House, board of superintendent	$14 00
	335	F. M. Manning, superintendent's expenses	8 20
	347	F. M. Manning, superintendent's expenses	1 20
		Total	$23 40

GENERAL SUPERINTENDENT.

Nov. 10,	308	Hibbard House, board of superintendent	$9 50

DAIRY DEPARTMENT.

Nov. 10,	309	Hurd House, board of superintendent	$10 00
	332	Chas. Kipp, superintendent's expenses	6 60
		Total	$16 60

RECEPTION COMMITTEE.

Nov. 10,	339	Philo Parsons, chairman's expenses	$11 30

SUMMARY STATEMENT.

Expenses winter meeting	$375 33
President's office	40 74
Treasurer's office	683 44
Secretary's office	1,332 98
Building (labor, hardware, paint, glass, etc.)	3,226 19
Lumber	1,596 83
Water	184 20
Printing	811 81
Taking down buildings, Detroit	379 64
Postage	128 53
Bond premium	767 50
Locating committee	82 85
Rent of grounds, Detroit	500 00
Lansing meeting	178 70
General expenses, $611,64, fire relief, $500, chariots, $500	1,611 54
Stationery	104 63
Freight	267 40
Express	19 57
Hotels and board	162 50
Business committee, expenses	46 45
Renting and collecting booth rent and clerk business committee	150 00
Horticultural Society	1,036 64
Decorating	46 66
Grounds	162 50
Power	418 29
Bill posting	10 80
Music	90 00
Medals and diplomas	35 70
Forage	974 54
Gates and gate keepers	185 68
Lunch room and ladies' waiting room	239 15
Meal tickets	156 46
Children's and needle work department	36 76
Horse department	208 75
Police department	329 75
Transportation committee	17 00
Manufacturers' department	38 95
Cattle department	92 00
Swine department	15 00
Sheep department	10 45

Miscellaneous department	$18 00
Carriage department	20 75
Agricultural department	23 31
Art department	144 86
Marshal's department	101 36
Poultry department	53 05
Implement department	53 70
Machinery department	23 40
General Superintendent	9 50
Dairy department	16 60
Reception Committee	11 30
Total	$17,231 74

MONEY RECEIVED BY BUSINESS COMMITTEE AND PAID OVER TO TREASURER FOR BOOTH RENT, PEDDLERS' PERMITS, ETC.

1881	*Lease No.*		
Aug. 13,	1	Ladies' Aid Society, First Baptist Church	$150 00
	2	C. Levy	90 00
	3	Moses Fosh	60 00
	4	J. M. Seward	30 00
	5	Methodist Church	120 00
	6	Steuben Wine Co.	60 00
	7	Mrs. Wm. Neil	30 00
	8	F. Schulte and L. E. Francis	36 00
	9	Albert Frank	36 00
19,	10	Daughters of Rebekah	48 00
22,	11	N. H. Eckler	60 00
	14	Fry & Wilson	48 00
Sept. 17,	15	Charles Cohen	48 00
Aug. 27,	16	David DeMay	51 00
31,	17	Daniel Osborn	30 00
	18	E. H. Hickman	72 00
	19	George Hough	78 00
	20	Clarance Chapman	36 00
	21	Herman Reed	42 00
	22	James Bryant	30 00
	23	A. P. Bail	18 00
	24	A. G. Bishop	12 00
	25	S. Hickman	54 00
	26	W. S. Todd	48 00
Sept. 1,	27	Maloney & Tubbs	36 00
6,	28	Hall & Soles	21 00
	29	Henry Kirchberg	33 00
8,	30	M. E. Church, Napoleon	54 00
10,	31	Catholic Church	60 00
11,	32	Mrs. Wm. Neil	30 00
	33	Thomas Mills	36 00
14,	34	Baptist Church	54 00
15,	35	Henry Felter	36 00
17,	36	F. B. Taylor	50 00
	37	John O'Brien	100 00
	38	James Field	12 00
	39	W. J. Turrens	7 50
	40	C. H. Slater	15 00
	41	Mortimer Bartlett	15 00
	42	D. M. Dearing	10 00
	43	H. Dunlap	15 00
	44	G. E. Gould	35 00
	45	H. L. Montford	50 00
19,	46	C. Ellis	25 00
	47	W. B. Abrams	12 00
	48	A. Grover	55 00
	49	W. J. Turrens	9 00
	50	W. Searls	6 00
	51	Hartman Rice	6 50
	52	A. H. Adams	10 00
	53	C. S. Hampton	10 00
	54	F. H. Clough	7 50
	55	J. L. Lemon	12 00
	56	L. J. Fish	7 50
	57	Frank Ford	10 00
	58	Andrew Miller	25 00
	59	Cagney & West	10 00
	60	Thomas Markey	7 50
	61	Vinkle Bros	10 00
	62	E. Purdy	15 00
	63	E. P. Hunt	18 00
	64	G. H. Hay	15 00
	65	John Stoddart	25 00
1881.	*Lease No.*		
Sept. 19,	66	Weston & Williams	$50 00
	67	J. V. Ford	40 00
	68	Wm. Ostatag	30 00
	69	W. H. Stevens	20 00
	70	J. J. Wilson	25 00
	71	E. W. Wiggins	100 00
	72	W E. Larman	7 50
	73	G. Stewart	15 00
20,	74	C. H. King	10 00
	75	R. H. Hawley	18 00
	76	Drs. Russell & Booth	35 00
	77	Forrester & Quinn	15 00
	78	A. B. Higgins	5 00
	79	Wm. Ebeling	9 00
	80	John Thackley	7 00
	81	John A. Welcome	15 00
	82	L. F. Feath	45 00
	83	H. N. Bliler	12 50
23,	84	F. K Ferguson	15 00
	85	R. E. Emmons	50 00
		Total am't rec'd for booth rent	$2,776 50

PEDDLERS' PERMITS.

Sept. 19,	Joseph Dryfus, jewelry	$10 00
	John Branchford, jewelry	7 50
	Walter Candy, popcorn	5 00
	Charles Thatcher, canes	7 50
	James Brown, knifeboard	5 00
	W. H. Tuttle, barometers	5 00
	E. H. Johnson, microscopes	7 00
	Dan. B. Birdsall, grapes	4 00
	L. H. Roath, grapes	4 00
	Thomas Pine, type	5 00
	E. D. Preston, needles	5 00
	John A. McKeehan, songs	3 00
	A. Berger, pocket-books and knives	10 00
	Frank Mack, dates	5 00
20,	D. R. Parish, cider	10 00
	Peter Morris, bead-work	2 00
	C. B. Morse, jewelry	7 00
	D. M. Dearing, popcorn	2 00
	J. Whitney, liniment	7 00
	M. Benjamin, canes	7 50
	A. B. Higgins, cider	10 00
	Indian, pocket books	10 00
	Kredel Mintzen, pocket books	10 00
	H. W. Sinclair lifting machine	5 00
	E. H Norman, ball game	5 00
	John McCumble, needle work	1 50
	F. Shedder, gum drops	5 00
21,	Peter Morris, needle work for four	8 00
	Job Kafe, needle work for 2	4 00
	Mrs. Jacob, " " " 1	2 00
	Mrs. Murray, " " " 2	4 00
	Martin Fox, jewelry	10 00
	Tom Rice, needle work	2 00
	O. F. Packard, notions	10 00
	John McCuber. needle work	3 00
	Tom Rice, needle work	1 50
	H. Grosser, telescopes	4 00
	G. H. Williams, knife board	5 00
	J. W. Fisk, soap	3 00
	J. Obrier, card writing	5 00
	C. Douglass, whistles	5 00
	C. H. Lingenfeter, stones	3 00
	J. C. Werum, balloons	5 00
	Geo. Tuttle, lifting machine	2 00
	James Fosh, candy	6 00
22,	Colored Gent, gun	2 00
	Stove Handles	1 00
	Water Melons	3 00
	Total permits	$253 50

Total amount received from booth and peddlers' permits	$3,030 00
Received from check room	69 50
" " lumber sold	20 00
" " brick	25 00
" " wood	15 00
" " butter	4 00
" " lime	2 00
Total am't paid treasurer	$3,165 50

WINTER MEETING, 1882.

STATEMENT OF PROPERTY SOLD BY ORDER OF BUSINESS COMMITTEE MICHIGAN STATE AGRICULTURAL SOCIETY AND AMOUNT PAID TREASURER DEAN BY J. M. STERLING.

June 1,	Forage sold, as per statement received	$34 50
	Lumber sold, as per statement received	623 26
Aug. 13,	Lawn mower and sickle	10 00
	Lumber, as per statement received	61 00
Sept. 20.	Lumber, as per statement received	52 00
	Ladies' cottage	76 00
	Total	$8576 6

INVENTORY OF PROPERTY BELONGING TO THE MICHIGAN STATE AGRICULTURAL SOCIETY IN THE CITY OF JACKSON.

1 wagon shed	24x100	feet
1 speaker's stand	20x20	"
1 press building	18x24	"
1 express office	14x20	"
1 Business Commissioner's office	12x16	"
1 Marshal's barn	24x48	"
1 Check room	12x16	"
1 Implement shed	50x100	"
1 Cattle amphitheatre	50x100	"
1 Well shed	14x14	"
160 Single horse stalls	5 ft. 4 in. x14	"
25 Box stalls	8x14	"
138 Single cattle stalls	5 ft. 4 in. x14	"
20 Bull stalls	8x14	"

178 Sheep and swine pens.
1,716 feet ¾-inch water pipe.
1,062 feet inch water pipe.
321 feet ½-inch water pipe.
19 Keys for water pipe.
12 Elbows, 18 stop cocks.
4 ½-inch elbows.
2 Oil cans.
1 Package lampblack.
25 Pounds 6-pd wrought nails.
25 Pounds 10-pd nails.
12 Water gauges.
1½ Rolls tar paper.
3 Bedsteads.
219 Feed troughs.
14 Lamp posts, 1 flag pole.
1 Straight edge, 4 nail cutters.
1 Box checks (baggage).
28 Brass water faucets.
6 Ts to water pipe.
1 Dozen tin cups.
2 Gas tongs, 10 pails.
6 Common chairs.
Part box tin 14x20.
1 Dust brush.
1 Looking-glass, 8 pillows.
12 Mattresses, 8 comfortables.
19 Pieces mosquito netting, red.
15 " " " white.
13 " " " blue.
1 Piece mourning goods.
2 Pieces black cambric.
3 Pieces blue cambric.
30 Signs.
1 Ship fly, 2 National flags.
1 Pomological flag.
1 Floral hall flag.
24 Small flags.
6 Wash tubs, 10 ticket boxes.
8 Wash basins, 1 grindstone.
Rubber hose and cart.
2 Hay forks, 1 post auger.
2 Iron rakes, 1 scythe and snath.
2 Wooden rakes, 1 snow shovel.
1 Set blocks and tackle.
1 Straw fork, 2 grub hoes.
1 Ax, 1 round-pointed shovel.
1 Old cook-stove, zinc and pipe.
12 Brooms, 1 coffee-boiler.
1 Dish pan, 1 dripping pan.
3 Tin pails, 3 teapots.
1 Tea kettle, 1 iron pot.
16 Lamps, 8 lanterns.
1 Oil can, 2 hand saws.
1 Square, 1 sprinkling pot.
Stencils and outfit, 6 tables.
1 Brand iron, 1 screw driver.
3 Tack hammers, 1 spirit level.
1 Hatchet, 1 hammer, 1 monkey-wrench.
1 Lot sash, 3 pieces table linen.
3 Rolls paper trimmings.
50 Feet rubber belting.
3 Spades, 4 iron bars, 1 work bench.
1 Smoke-stack and front.
280 Chicken feed-boxes.
30 pieces shaftings and couplings—700 feet.
2 Ladders, 3 fish aquariums.
10 Table spoons.
4½ Dozen tea spoons.
3½ Dozen knives and forks.
1 Carving knife and fork.
4 Round tanks.
11 Tank troughs.
45 Shaft horses.
75 Feed boxes.
5 Band wheels.
7 Tables.
23 Benches.
1 Business committee chest.

INVENTORY OF PROPERTY IN THE CITY OF DETROIT BELONGING TO THE STATE AGRICULTURAL SOCIETY.

1 Main building.
1 North wing Mechanics' Hall.
1 Octagon part of Pomological Hall.
1 Judges' stand.
1 Grand stand.
1 Dwelling, Jennings' cottage.
1 Barn, Jennings'.
Fence enclosing fair-grounds.
Gate houses, or treasurer's office.
1 Lumber wagon and sprinkler.
1 Mower.
1 Old Mower.
1 Hay rake.
1 Drag.
1 Road scraper.
1 Track scraper.
1 scythe and snath.
2 Hay forks.
1 Bell and hangings.
2 Oil cans.
1 Box of glassware.
1 Field roll.

All of which is respectfully submitted,

JOHN GILBERT,
WILLIAM BALL,
W. H. COBB.

SECOND DAY.

RUSSELL HOUSE, DETROIT,
January 10, 1882.

The Executive Board was called to order this morning by President Fralick.

Roll called. Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Butterfield, Gilbert, Anderson, Beckwith, Baxter, Phillips, and the Secretary.

It was moved and supported that the reading of the journal be dispensed with. Carried.

Reports of superintendents were called for. Mr. Cobb, Superintendent of Division B, submitted the following:

To the President and Executive Committee of the Michigan State Agricultural Society:

The Superintendent of Division B would respectfully submit the following report:

The entries in class 12, thoroughbreds, were 11; in class 13, horses of all work, 132; in class 14, roadsters, 62; in class 15, breeders' stock, 88; in class 16, gents' driving horses to road wagons, 44; in class 17, draught horses, 52; in class 18, carriage and buggy horses of both sexes, 43; in class 19, Michigan horses, roadsters and stallions, 16; in class 20, Michigan horses, mares and geldings, 69; in class 21, sweepstakes for stallions with six of their get, 11; making a total of 528 entries.

In this large number of horses there was not a poor one to be found, and the superintendent is fully satisfied that there is a marked improvement in the horses shown over former years.

The amount of premiums awarded in this department was $2,958; amount offered, $3,557.

The exhibitors, as far as the superintendent was able to learn, were well satisfied with the amounts awarded in each class.

There are many things pertaining to the horse department that can not be understood except by actual experience. The large number of exhibitors that come together in such a hurried manner, bringing over half a thousand of horses with them, all wanting the best stalls, is apt to make the superintendent think he has something to look after.

At our last Fair the grounds were small and the stalls crowded close together, leaving but a small portion of ground to move horses upon, which was to be regretted. The track was in fine condition and very satisfactory.

In order to go through with so many classes and do justice to the exhibitors, is a duty that judges as well as superintendents find to be very arduous and difficult in the short time allotted.

It can hardly be expected that where there are so many very fine horses to be examined but that some one will be dissatisfied, although the judges may strive to do justice to all.

The superintendent wishes at this time to thank the gentlemen who acted for the society as judges at the late fair, for their patient and careful labors, believing them to have been well qualified to fill the place they occupied.

Respectfully submitted,
W. H. COBB,
Superintendent.

Accepted and adopted.

Mr. Burrington, Superintendent of Division C, made the following report:

To the President and Executive Committee of the Michigan State Agricultural Society:

The Superintendent of Division C, would respectfully submit the following report:

The whole number of entries in this division at the last fair was 410, an increase of 88 over the preceding year.

The number of entries in each class was as follows: Class 22, thorough-bred American merinos, 143; Class 23, fine wool grades, 26; Class 24, Southdowns, 54; Class 25, middle wool, other than Southdowns, 46; Class 26, Leicesters, 34; Class 27, Cotswolds and other long wools, 68; Class 28, coarse wool grades, 20; Class 29, fat sheep, 22. The total amount of premiums offered was $1,139. The amount awarded was $1,119.

The superintendent has no changes to recommend in regard to the premium list. The exhibition, both in numbers and quality, was superior to that of any previous year since I have had charge of the department. To the Awarding Committee, I am much indebted for the thorough and impartial manner in which they discharged their arduous duties. The difficulty in obtaining thoroughly competent men to serve on these committees, is year by year, becoming more difficult. Few men are willing to give their time and bear their own expenses, their only reward often being the unjust censure of those disappointed by their decisions. Some of the committee at the last fair expressed their determination never to serve again without pay.

All of which is respectfully submitted.

J. Q. A. BURRINGTON,
Superintendent.

Accepted and referred.

Mr. Ball, Superintendent of Division I, made the report from that department as follows:

To the President and Executive Board of the Michigan State Agricultural Society:

In Division I, Class 46, the number of entries were 148. The exhibit, in my opinion was, so far as quality was concerned, superior to any previous one since my connection with that department. Some little embarrassment arose on account of a lack of space desired by some exhibitors, but in the end everything proved comparatively satisfactory. The usual modesty belonging to exhibitors in that department was observed, and with an exceptional outburst of temper, everything passed off in good humor.

WILLIAM BALL,
Superintendent.

Accepted and referred.

Mr. Chamberlain read the following report as Acting Superintendent of Division L.:

To the President and Executive Committee of the State Agricultural Society:

The undersigned was placed in charge of this department on the second day of the fair, after many of the exhibitors had been assigned space, as many of the exhibits in this department are not entitled to premiums. The exhibitors of musical instruments and sewing machines desire considerable space to make a good display of their goods, and as these displays are an attractive feature of the fair, ample space should be given. I would suggest that it is important that superintendents who have charge of these departments, should be on the ground early, and remain until all are well fixed. The display in this department was very good, and more satisfactory than when premiums are offered.

There were four exhibitors of musical instruments, and as many more of sewing machines.

In classes 55 and 56 nearly ninety dollars in premiums were offered, but only five dollars in premiums and diplomas were awarded.

W. CHAMBERLAIN,
Acting Superintendent.

Accepted and referred.

Mr. Chas. W. Garfield, Secretary of the State Horticultural Society, submitted the following report of the Pomological Department:

Mr. President and Members of Executive Committee State Agricultural Society:

GENTLEMEN,—The report of the Pomological Department of the fair will be printed in full with schedule of prizes in our annual volume as usual. It will be issued soon, and advance sheets sent to each member of this committee. I wish simply to make one suggestion concerning the fruit and flower exhibit at this meeting. People visiting the hall want to be surprised by something new and beautiful, and it seems to me that it is just as important to educate the public taste as it is to cultivate a knowledge of fruits and flowers. Hence my suggestion that some plan be adopted by which the interior walls of Horticultural Hall be completely decorated in the same way the shelves and tables are decorated—by people who are competing for premiums. This is the place for such embellishment, and I am satisfied the most beautiful effect can be produced by the appropriation of a small amount of premiums in this direction. The State Horticultural Society, should it exhibit with you again, will certainly be glad to take hold of some scheme of this character, and do all that is possible to make it a complete success. Our exhibit last fall was good. The table of single plates of apples, pears, peaches, grapes, and plums *has never been surpassed.*

Respectfully submitted,

CHAS. W. GARFIELD,

For Michigan State Horticultural Society.

On motion accepted and referred.

The following report from the Superintendent of the Art Department was read and, on motion, accepted and referred;

The Superintendent of the Department of Fine Arts would respectfully report to the Executive Committee of the State Agricultural Society, that the exhibit of the last fair at Jackson was the largest and most complete, perhaps, ever made. On no occasion during the history of the society has there been so large, varied, or meritorious an exhibition of works, by Michigan artists, of real value, showing marked progress in taste and execution, as came before the Viewing Committee last fall. Indeed, the works of merit were so numerous, and evidence of progress so great, by Michigan artists, that it was a matter of no small responsibility to decide to whose works premiums should be awarded. It was noticeable, also, that those evidences of refinement and taste were not confined to the older and more settled portions of the State, but some of the best were from the more newly settled regions away from cities, indicating the presence of high culture and advanced education in art studies.

We have great reason for congratulation that the attention of our youth is being turned in this direction. It is alike honorable to them and gratifying to the State. The Gala collection of paintings, containing nearly one hundred pictures, many of them by eminent Eastern artists of assured reputation, contributed greatly to the art display. The society were peculiarly fortunate in being able to present to the public, through A. J. Brow, a gallery of so much merit, the appreciation of which was so constantly apparent in crowded rooms. The Viewing Committee, consisting of Messrs. P. Parsons, P. Hayden, and H. C. Lewis, respectfully ask a careful review of the premium list by competent persons, and an increase in amount of premiums as an inducement to continued progress.

Respectfully submitted,

C. A. HARRISON,
WM. CHAMBERLAIN.

Mr. Cobb moved, and it was voted that the chief marshal be requested to report.

Mr. Hyde then submitted the following, which was accepted and referred:

To the President and Executive Committee of State Agricultural Society:

There is nothing, perhaps, beyond the ordinary routine of marshal work to report in this department, except the fact that the work was entirely done with two assistants instead of three, as usual. Arrangements had been made previously to the fair, to have three assistants: Messrs. Hinds, of Montcalm, Hodge, of Van Buren, and Youst, of Washtenaw. Mr. Youst was detained by sickness, and could not attend. Messrs. Hinds and Hodge were consulted in regard to looking up another assistant. Both of those gentlemen said, "Let us try it; we think we can do the work." It is true that we had a busy time. I cannot speak too highly of our efficient assistants, but the enduring superintendents in both horse and cattle departments were as obliging as we tried to be, and all went on harmoniously to the end, with a much less aggregate expense to the society than in former years.

A. O. HYDE,

Chief Marshal.

Mr. Burrington, to whom was referred the protest against the awards on Messrs. Moore and Kelley's sheep in class 28, at the last fair, reported that in his judgment the protest should not be sustained.

Report accepted and adopted.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The committee to whom were referred the addresses of the outgoing and incoming presidents, for assignment of subjects to appropriate committees, would respectfully recommend:

That so much of said addresses as refers to premiums and special encouragement to be given in different departments be referred to Committee on Premium List.

That so much as refers to special encouragement for machinery and agricultural implements manufactured within this State be referred to Committees on Rules and Premiums jointly.

That so much as refers to the selection of one or more places for permanent exhibitions of the society be referred to a special committee of five, to report whether in their judgment any action should be taken at the present time, and if so to recommend a course of procedure.

That so much as refers to the selection of viewing committees and securing suitable judges in the various departments and classes be referred to the Committee on Rules.

That so much as refers to the place of holding the next annual fair be referred to the Committee of the Whole.

Respectfully submitted,
W. J. BAXTER,
A. O. HYDE,
W. H. COBB.

Report adopted.

A communication from the American Berkshire Association was read by the secretary, and on motion referred to the Committee on Premiums.

Mr. Cobb read a notice of the ninth annual meeting of the State Association of Agricultural Societies of Michigan, and stated that this association is entitled to three delegates. The communication was laid on the table.

Mr. Parsons presented an invitation from Messrs. D. M. Ferry & Co., asking the Executive Board to visit their establishment.

On motion of Mr. Parsons the invitation was accepted.

The secretary read a communication from the Illinois State Board of Agriculture, relative to the annual fat stock show of that board.

Referred to Committee on Distribution of Reports.

President Fralick offered the following:

To the Officers and Members of the Executive Committee of the Michigan State Agricultural Society:

I respectfully tender my resignation as a member of said committee.

HENRY FRALICK.

On motion the resignation was accepted.

Moved and supported that a committee of nine be appointed to make nominations to fill vacancy caused by the resignation of Mr. Fralick. Carried.

The president subsequently appointed as such committee Messrs. J. M. Sterling, W. H. Cobb, W. G. Beckwith, A. J. Dean, Philo Parsons, F. L. Reed, Abel Angel, I. H. Butterfield, Jr., and Jno. Gilbert.

The president then announced the following standing committees:

COMMITTEE ON FINANCE.

William Ball, E. W. Rising, M. P. Anderson.

COMMITTEE ON RULES.

C. A. Harrison, G. W. Phillips, J. Q. A. Burrington.

TRANSPORTATION COMMITTEE.

J. M. Sterling, W. J. Baxter, W. L. Webber.

COMMITTEE ON PROGRAMME.

W. H. Cobb, A. O. Hyde, F. V. Smith

COMMITTEE ON RECEPTIONS.

Philo Parsons, H. G. Wells, M. Shoemaker.

COMMITTEE ON PRINTING.

A. J. Dean,	J. C. Sterling,	John Lessiter.

On motion of Mr. Phillips, a committee of three was appointed to confer with like committee from the State Horticultural Society. Committee, Messrs. Parsons, Phillips, and Wood.

Mr. Baxter moved that the Committee on Nominations be instructed to bring in at least three names to be balloted for by the committee. Carried.

On motion of Mr. Dean, it was resolved that the gentlemen present who represent associations wishing to confer with the society be invited to address the meeting.

Mr. H. D. Cutting, President of the Michigan Bee-Keepers' Association, accepted the invitation and addressed the committee, stating that the premium list was perfectly satisfactory to his association, so far as it goes, and asked that the society give them a special building, competent judges, etc.

Mr. Dean moved that the matter be referred to the Premium Committee. He subsequently withdrew the motion and it was referred to the Business Committee.

Mr. Parsons moved and it was supported that a committee of five be appointed to take into consideration the subject of the sale of stock and goods at the fair, and to report as soon as practicable. Carried.

Mr. Beckwith moved that a committee of three be appointed to present the names of three judges for the cattle department. A lengthy discussion was held on the question, which was participated in by Messrs. Phillips, Butterfield, Hanford, Wood, Uhl, Brooks, Wixom, Ball, Parsons, and Lessiter. The matter was then on motion referred to the Committee on Rules.

The president then announced the Committee on Sale of Goods and Stock during the fair—Messrs. Parsons, Baxter, Sterling, Dean, and Beckwith.

The president appointed as Business Committee for the ensuing year, Messrs. Jno. Gilbert, W. H. Cobb, and A. O. Hyde.

The committee then took a recess until 2 o'clock.

AFTERNOON SESSION.

The committee resumed business at 2 P. M.

President Fralick in the chair.

Quorum present.

The Committee on Nominations reported, nominating John L. Mitchell, of Jackson, Jacob Walton, of Cheboygan, and H. H. Hines, of Stanton.

Mr. Sterling moved to proceed to a formal ballot for member of Executive Committee to fill vacancy, and that a majority of all the votes cast shall be required to elect. Carried.

Messrs. Dean and Sterling were appointed tellers.

Tellers reported 21 votes cast, of which John L. Mitchell, of Jackson, received 12, H. H. Hines, of Stanton, 4, Jacob Waltyn, of Cheboygan, 4, Dwight Merriman, of Jackson, 1.

On motion, John L. Mitchell was declared unanimously elected.

The secretary was instructed to notify Mr. Mitchell by telegraph of his election and request his immediate attendance.

Mr. Rising, Superintendent of Forage, reported for that department:

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN,—The Superintendent of Forage would report that having charge of this department for the last eight years, there never was such good feeling and general satisfaction manifested as last year, and considering the large amount of stock on exhibition and the varied interest concerned was satisfactory to me at least, and owing to the good luck of procuring of prices early in the season, we were able to make our expenses about $520.50 less than last year at Detroit, and, having more stock on exhibition, this was gratifying. It was also gratifying to be able to make contracts with good, reliable parties, that were willing to fulfill them on their part and furnish a good article. Bales of hay and straw, although pressed, went up. And owing to certain emergencies arising, the superintendent in his judgment varied some rules or instructions, which he could not carry out without an additional expense to the society, which is at your approval or disapproval.

All of which is respectfully submitted.

E. W. RISING.

Accepted and referred.

Moved and supported that the committee take a recess till 5 o'clock. Carried.

The Executive Committee reässembled at 5 o'clock.

President Fralick presiding. Quorum present.

The Committee on Conference with the Horticultural Society reported through their chairman, Mr. Parsons:

To the President and Executive Committee of the State Agricultural Society:

GENTLEMEN,—Your committee, who were appointed to confer with a like committee of the Michigan Horticultural Society, would report that they have held such conference, which was considerably protracted, and the relations of the two organizations to each other fully and carefully considered, and the claims of the Horticultural Society as a permanent element of value and interest to the Agricultural Society recognized. Each year this kindred institution is extending the bounds of its usefulness, as a power of growth and material wealth. Your committee are, therefore, disposed to recommend to them additional means that they may be able to meet the demand upon them for greater facilities. We would, therefore, ask you to place this institution in the position it occupied previous to last year, and that it receive from your society one thousand dollars for premiums to be paid as heretofore, and fourteen hundred dollars for current expenses. It will be noticed that the organization bears the name horticultural, embracing in the scope of its aim and efforts all that the new name imports, flora culture included, requiring, therefore, the full appropriation recommended. Your committee would also recommend that the officers of the State Horticultural Society be held responsible for the enforcement of the rules and regulations of the fair in their hall, particularly so far as sales by auction, handling, and removal are concerned. We would further recommend that exhibitors entitled to premiums from the Horticultural Society be permitted to take in lieu thereof a life membership in said society, and the premium due to them be issued to said society as a portion of its permanent fund.

P. PARSONS,
G. W. PHILLIPS,
A. F. WOOD,
Committee.

It was moved and supported that the report be accepted. Carried.

Mr. Sterling then moved its adoption and the motion was carried unanimously.

The committee on the Chapman protest reported as follows:

To the President and Executive Committee of the State Agricultural Society:

Your committee appointed to investigate the application of H. B. Chapman for payment of premium which he claims ought to have been awarded some ten years ago, find to their satisfaction that the question was disposed of some years ago and recommend no further action in regard to it.

A. O. HYDE,
H. O. HANFORD,
Committee.

Accepted and adopted.

On motion, the minutes of Monday evening's session were adopted as printed.

The secretary read a communication from Mr. Loring, Commissioner of Agriculture, relative to the Agricultural Convention now in session at Washington.

Remarks were indulged in by Messrs. Parsons, Beckwith, and Butterfield, and the communication received and placed on file.

On motion, Mr. Parsons was commissioned to represent the society at the Washington meeting, without expense to this society.

The meeting then adjourned to meet at 9 o'clock Wednesday morning.

THIRD DAY.

RUSSELL HOUSE, DETROIT,
January 11, 1882.

The Executive Committee resumed its session at 9 o'clock A. M. President Fralick called the meeting to order.

The roll was called and the following named members found present:

President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Phillips, Beckwith, Baxter, and the secretary.

The communication from the State Association of Agricultural Societies of Michigan was taken from the table, and on motion of Mr. Cobb three delegates were appointed to represent this society at the annual meeting of that association.

The president announced as such delegates, Messrs. W. H. Cobb, W. G. Beckwith, and Wm. Ball.

The Premium Committee asked to be excused, and on motion, the request was granted.

The president appointed W. J. Baxter, A. J. Dean, John Gilbert, Geo. W. Phillips, and J. M. Sterling a committee on that part of the president's address relative to permanent location.

The committee appointed at the Lansing meeting to examine into the management of the Agricultural College Farm, read their report.

It was moved and supported to accept and adopt the same.

A discussion was had on the subject, which was participated in by Messrs. Ball, Phillips, Beckwith, Parsons, and Hanford.

Mr. Parsons then moved that the report be printed and laid on the table until to-morrow morning.

The motion prevailed.

Mr. Parsons presented an invitation with the compliments of Mr. C. J. Whitney, asking the Executive Board to visit his theatre this evening.

Mr. Phillips moved that the invitation be accepted, and a vote of thanks be extended to Mr. Whitney. Adopted.

On motion of Mr. Parsons, it was

Resolved, That a committee of three, with J. M. Sterling as chairman, be appointed by the chair, to make an estimate of the cost of replacing the buildings removed, with sufficient additional structures and repairs necessary to hold a successful fair at Detroit.

In accordance with the above resolution the president announced the following committee, Messrs. J. M. Sterling, John Gilbert, and Philo Parsons.

A recess was then taken until 2 o'clock.

AFTERNOON SESSION.

President Fralick called the committee to order at 2:30 o'clock.

Quorum present.

Reports of standing committees were called for, and Mr. Ball, chairman of Finance Committee, offered the following reports:

REPORT OF THE FINANCE COMMITTEE.

To the President and Executive Committee of the State Agricultural Society:

The Committee on Finance, to whom was referred the report of the treasurer, would respectfully report that they have had the same under consideration, and have carefully compared said account with the accompanying vouchers, and find the same to be correct.

All of which is respectfully submitted.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

DETROIT, January 11, 1882.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Committee on Finance, to whom was referred the financial portion of the secretary's report, say that they have had the same under consideration, and respectfully report that they have examined the same and compared his account of checks with their vouchers, the checks with the stubs, and find them to agree and the account correct, and find his account of statement of premiums, medals, and diplomas also correct.

All of which is respectfully submitted.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

DETROIT, January 11, 1882.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Committee on Finance, to whom was referred the report of the Business Committee, respectfully report that they have examined the records of accounts and transactions of the Business Committee of said society, and have compared them with the vouchers in the hands of the secretary, and find the record to agree and the account correct. Also, the report of the said committee of the amounts received for rent of booths, peddlers' permits, and property sold belonging to said society, and we certify that said amounts have been paid to the treasurer and hold his receipt therefor and for which he has rendered an account, and that we find the statement, vouchers, accounts, and receipts correct.

All of which is respectfully submitted.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

DETROIT, January 11, 1882.

It was voted to accept and adopt the above reports of the Finance Committee.

The Horticultural Society accepted the proposition made them by the Executive Committee yesterday in the following letter:

DETROIT, January 10, 1882.

To Henry Fralick, President Michigan State Agricultural Society:

SIR,—On behalf of the Michigan State Horticultural Society, I hereby accept the proposal of your Executive Committee, as to-day reported by the Committee of Conference and adopted, that this society take charge of the department of fruits and flowers at the annual fair for 1882, as in seasons, and upon the terms expressed in the report of such committee.

T. T. LYON,
President.

A communication from Mr. F. Morley, presenting twenty-four copies of "Michigan and its Resources," was received and on motion accepted, and the secretary requested to tender the thanks of this society to Mr. Morley.

Mr. Parsons moved to reconsider the vote taken this A. M., to print and table the report of the Committee on College Farm.

The motion prevailed.

The same gentleman then moved, and it was supported, that the report be laid on the table. Carried.

The committee then took a recess until 4 o'clock.

The committee reässembled at 4 P. M.

The Committee on Premium List offered the following:

To the President and Members of the Executive Committee of the Michigan State Agricultural Society:

Your committee, to whom was referred the revision of the premium list for 1882, would respectfully report, that we have carefully considered the recommendations of the superintendents of the several departments, and from the information we have received, have thought it advisable to recommend the accompanying list for adoption as the premium list of this society for 1882.

WM. CHAMBERLAIN,
H. O. HANFORD,
I. H. BUTTERFIELD, JR.,
A. O. HYDE,
D. W. HOWARD.

Mr. Rising moved that so much of the report as related to cattle be adopted as received.

A lengthy discussion was had, in which most of the members present took part.

Mr. Smith then moved as a substitute, that the list of last year be adopted.

Mr. Smith's motion was lost by the following vote:

Yeas—Messrs. Sterling, Smith, Harrison, Beckwith, Baxter, Phillips—6.

Nays—Messrs. Rising, Hanford, Ball, Lessiter, Cobb, Reed, Hyde, Mitchell, Burrington, Wood, Chamberlain, Angel, Howard, Butterfield, Treasurer—15.

The original motion was then adopted.

Mr. Baxter then moved, and it was supported, to adopt the balance of the report of the committee without reading. Carried.

The board then adjourned till 9 o'clock Thursday morning.

FOURTH DAY.

RUSSELL HOUSE, DETROIT,
January 12, 1882.

The Executive Committee met pursuant to adjournment. President Fralick in the chair.

The secretary called the roll.

Present: President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Anderson, Beckwith, Baxter, Phillips, and the secretary.

Mr. Butterfield read the report of the delegates to the State Association of Agricultural Societies.

Your committee appointed to represent this society at the Association of Agricultural Societies for this State, respectfully report that they attended the meeting of that association at Lansing, in January last.

The attendance was good, and the representation from the various societies was fair.

The topics discussed were such as pertain to the special and general management of fairs, and these discussions tend to a more uniform system of rules and regulations, tending to give many societies better systems.

A general review of the proceedings is not necessary at this time.

Undoubtedly the greatest benefit that this society can receive from representation at these meetings, is the encouragement of mutual good feeling with the various District and County Societies.

The association has undertaken a good work, and is worthy of encouragement by the several Agricultural Societies of the State.

I. H. BUTTERFIELD, JR.
WM. BALL.

It was voted to accept and print the report.

On motion, the proceedings of Tuesday's meeting were approved.

On motion, the report of the Committee on Agricultural College Farm was taken from the table and again read, as follows:

To the Executive Committee of the State Agricultural Society of Michigan:

Your committee, to whom was assigned the duty of writing a report of our meeting at the State Agricultural College, beg leave to submit the following report:

We, with many other officers of our society, became the guests of the college on Wednesday, June 1, and went the grand rounds, minuting mentally, as best we could on such an occasion, the condition of the buildings, grounds, stock, growing crops, and general appearance of economy, good management, and commendable discipline noticeable in each and every department. As visitors for a few hours, all seen on the surface must have received our approval and commendation; but our visit was not a surprise to the college; we were there by invitation; and it was suggested that everything had been swept, brushed, and garnished for the occasion. Your committee, therefore decided to again visit the college in its usual everyday life, and from that standpoint make our report. Accordingly we met at the college Wednesday, June 22, and were received by and became the guests of Prof. Johnson, the gentlemanly and efficient Professor of Agriculture. We remained at the college the greater part of two days, spending the time pleasantly and profitably, at least to us, and found everything moving along smoothly and harmoniously, perfect order and discipline being everywhere noticeable. We presume it is expected that, if we found in the general management of the farm anything which in our opinion should be changed somewhat, we report briefly thereon, and make some suggestions in relation thereto. And first we desire to speak of student labor. It must be apparent to everyone who has given the question any thought, that student labor is not and cannot well be made a source of profit; and, in fact, we do not understand that it was intended ever to make the college a source of revenue to the State, but to give the young men who go there an opportunity to gain a good education, including a thorough knowledge in *practical agriculture*, with the least expense possible to the State. That the officers of the college are now endeavoring conscientiously and systematically to do this, we think no one can question. As now arranged, students are required to labor three hours each day, receiving a credit therefor of eight cents per hour. Unnecessary work is now sometimes done to furnish labor sufficient to consume so much time. We would therefore suggest, that the hours of labor be regulated by the amount of labor to be performed; or, reduce each day's labor from three hours to two hours. The students work well, much better than could be expected under the circumstances and their surroundings; they are fine, manly looking young men, and go to work at their various tasks with a determination which, if carried out through life, will place them at the top of the ladder. As one evidence of their skill and good workmanship, we were shown a drain then under construction (one hundred rods already completed), which was as well done as the most experienced ditcher could do. The growing crops were all looking well (a marked improvement over last year). The first field of wheat was the best we had noticed anywhere; the second field was winter-killed. All the fields showed that much labor had been well and systematically done thereon. We do not deem it necessary to mention all the fields in detail, and the crops growing thereon. Many experiments are being made each year, a detailed statement of which, with the results therefrom, will be published at the close of each year.

Quite a full and able report was made last year by the Committee on the Farm Department, as to the stock owned by the college, and some suggestions were made therein which we heartily endorse, and here again recommend. Since said report the college has purchased some very fine and valuable Shorthorns, viz.: From the Jones & Hill herd, one bull—a very fine animal—and three cows, at a total cost of $975; and from Avery & Murphy one cow named "Peri Duchess," then with calf by "Oxford of Vinewood."

The calf was dropped soon after the purchase; and is not, in our opinion, as fine n animal as we expected to see from stock so finely bred. A second calf was dropped, by "Peri" in May, 1881; this calf was sick while we were at the college, and, as we are informed, has since died. In the opinion of your committee, the cow named "Crystal Queen 9th," from the Jones & Hill herd, is the finest cow owned by the college.

The college now owns stock as follows, viz.:

Shorthorns	31	head.
Ayrshires	13	"
Jerseys	3	"
Galloways	2	"
Hereford	1	"
Holstein	1	"
Total	51	

All are thoroughbred animals, and many of them are good representatives of the respective breeds.

SHEEP.

Merinos, registered Vermont bred	15
" college bred	57
Southdowns	32
Cotswolds	4
Total	108

SWINE.

Essex sows	7
" boar	1
Berkshire sows	2
Poland China	1
Total	11

No attention is paid to the breeding of horses.

We append herewith a milk record for the months of May and June, 1881, from some of the Shorthorn and Ayrshire cows, which, we think, will be studied with considerable interest:

Breed.	Name.	April.		May.	
		Total.	Daily Average.	Total.	Daily Average.
Shorthorns	Heroine	880½ lbs.	29 4-5 lbs.	968 lbs.	31 1-5 lbs.
“	Heroine 2d.	903 “	30 1-10 “	1064½ “	34 3-10 “
“	Hela 3d	521 “	17 2-5 “	530 “	17 1-10 “
“	Phœnix	632½ “	21 1-10 “	751 “	24 2-5 “
“	Peri	620½ “	20 7-10 “	643½ “	20 4-5 “
Ayrshires	Phile	633 “	20 “	682 “	22 “
“	Susie Steward	485 “	27 “	890½ “	28 7-10 “
“	Mary Steward	737 “	24 4-5 “	770 “	25 “
“	Lady Philly	602 “	20 “	626½ “	20 1-5 “
“	Phillacy	740 “	24 7-10 “	778 “	25 “

One acre of broom corn was planted this year, and cut October 7. The yield was very good, considering the season. In its manufacture it is hoped to find labor for the students, at seasons of the year when the farm offers very little. A silo has been built and filled with two acres (about 30 tons) of sowed corn, for the purpose of testing its value as to beef, milk, and growth production in comparison with the ordinary dried fodder; the results of these experiments will be reported in due time.

In regard to the system of rotation of crops, pursued upon the College Farm, your committee would endeavor to be frank in giving expression to their views. Fully in accordance with the sentiment, so universally prevalent that, in this State at least, no farming can be a complete success without including within its arrangements some intelligent method of rotation; but varying, as our State does, in the most remarkable manner as to soils and climatic latitudes, the formulas for rotative cropping must necessarily be numerous and changeful. Here, as elsewhere, the operations in husbandry are nearly all of them subsidiary to the natural elements surrounding them. The weather, markets, soils, and financial needs are necessarily the leading factors of all agricultural efforts, and any attempt to bring into general adoption a rigid and uniform system of crop permutations cannot, we believe, become a practical success.

Much has already been written, and experiments extensively and carefully instituted, to suggest and determine *what methods* shall be attended with the most beneficial results; and, if possible, what shall result in the most good to all; but thus far we find an acquiescence in the general principle only. What shall be the order of precession with which crops should be rotated? What crops shall head the list, and what and how many shall follow, and how long it shall take to complete the cycle, are questions upon which we find the wildest divergence of opinion; and these we believe are such as every farmer must study for himself and settle in consonance with his own individual circumstances and surroundings. No book or newspaper schedule, no college dictum, nor even the successful working of a neighbor's system, may be just adapted to his farming; and the man who does not use his own brain to investigate and decide for himself, will surely meet with financial disaster. As the cereals and grasses differ from each other in their elements of formation, so farms and portions of farms are dissimilar in soil, situation, and conditions, and no rule can be given which will be of universal application, or even of much value, as local authority. The object of all good farming should be to produce the largest yields of the best paying crops, and at the same time keep up and, if possible, improve the condition of the fields. And very much of the latter can be accomplished by the intelligent changing of crops, and it can never be omitted without manifest disadvantage and loss. By some teachers of agriculture a system of absolute rotation, almost imperative in its requirements, is strenuously insisted upon. Struck by the beauties of the theory, and carried away by enthusiasm, they seem to imagine that, in proclaiming rotation, they have struck the philosopher's stone, which, by its magical influence, will turn all harvests into gold. But we believe that every practitioner of agriculture is convinced that, however much he may desire it, the difficulties in the way of a single system, however well considered and scientifically arranged, if rigidly enforced, are supremely unsurmountable, storms, deluge, and draught, hail and hurricane, cut worm and weevil, fly, frost, and freeze, conditions of soil, and financial pressure—a spectral group—are sure to disarrange and thwart the programme. The best we can do with all our well laid rotative devices is to modify, patch, bridge over, and change with climatic and other conditions. Absolute rotation we deem to be an absolute impractibility, and can never be incorporated into our system of husbandry, unless we expect to set aside the fiats of nature and unsurp administration in her stead. The theory, beautiful in itself, and symmetrical in its lines of scientific proportions as it is, can only be applied in a climate of ideal perfection and a country where Utopian agriculture prevails.

A large part of the college farm is of quite light soil, and consequently requires better management than one of richer soil. We are, then, of the opinion that the rotative system there followed is not bringing the results that even this farm is capable of.

To sum up, then, we think, in stock, the college is hardly up to the standard we should reasonably expect.

In rotation of crops, we think a change should be made.

In grasses, we think clover should be substituted for timothy.

In student labor, we think the hours should be regulated by the amount of labor to be performed.

In conclusion, then, we must say that we found every day life at the college much the same as when visitors are present, the same thorough and practical general management being everywhere noticeable, and an almost universal feeling existing among the students that the college is on trial—fully realizing that with them a great responsibility is resting, and having a firm determination to do well and promptly their part.

Respectfully submitted,

W. G. BECKWITH,
C. A. HARRISON,
H. O. HANFORD.

Mr. Sterling moved the acceptance and adoption of the said report.

Mr. Smith then moved to amend the report by striking out all that part of the report after the words "Oxford of Vinewood," to and including the words "the finest cow owned by the college."

The yeas and nays were called for, and the amendment lost by the following vote:

Yeas—Messrs. Sterling, Ball, Lessiter, Reed, Smith, Wood, Parsons, Butterfield, Anderson, Phillips, president, treasurer, and secretary—13.

Nays—Messrs. Rising, Hanford, Cobb, Hyde, Mitchell, Burrington, Chamberlain, Angel, Howard, Harrison, Gilbert, Beckwith, and Baxter—13.

The yeas and nays were then called, and the report adopted by the following vote:

Yeas—Messrs. Sterling, Rising, Hanford, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Chamberlain, Parsons, Angel, Howard, Harrison, Gilbert, Beckwith, and Baxter—18.

Nays—Messrs. Ball, Wood, Bntterfield, Anderson, Phillips, president, and treasurer —7.

Mr. Dean asked to be excused from voting, but the motion to that effect was lost.

The Committee on Programme asked for instructions relative to advertising a grand cavalcade.

Mr. Beckwith moved that the grand cavalcade be continued and be announced in the programme. The motion prevailed.

Mr. Parsons then announced that Messrs. D. M. Ferry & Co. would be prepared to receive the committee at 2 o'clock this afternoon, and suggested that the committee meet at 2 o'clock and visit the establishment in a body.

Mr. Smith moved to strike out the word "Book" and insert the word "Register," where the name of the "American Jersey Cattle Club Herd Register" is referred to in the premium list, and to strike the name of the "American Jersey Herd Book" entirely from the list. Adopted.

It was then moved that the rules be made to conform with the premium list in reference to the "American Jersey Cattle Club Herd Register," and "American Jersey Herd Book." Adopted.

The committee then adjourned for dinner.

AFTERNOON SESSION.

The committee reässembled after recess.

President Fralick in the chair.

Quorum present.

Mr. Parsons submitted the following:

To the State Agricultural Committee:

GENTLEMEN—Your committee, to whom was allotted the question of sales of articles, animals, and all else on exhibition at the State Fair, have had the same under consideration, and would respectfully report that they are unanimously in favor of allowing all persons making exhibits to dispose of articles shown by them on the last day of the Fair. It is usually permitted in the British Isles, in France and elsewhere in Europe, and works greatly to the advantage of the producer—indeed, the last day of such shows in European countries is the day of marked interest, attracting purchasers from long distances, and large amounts of stock and other property change hands, greatly to the profit of the exhibitor.

P. PARSONS,
W. G. BECKWITH,
J. M. STERLING,
W. J. BAXTER,
A. J. DEAN.

Accepted and adopted.

The Committee on Rules reported through their chairman, Mr. Harrison, recommending the adoption of last year's rules, with the following changes and additions:

SEC. IV. Rule 8. Amended to read: "Goods and stock must be delivered on the grounds and put in place by exhibitors, and must not be removed until 4 o'clock P. M. of the last day of the Fair."

SEC. IV. Rule 10. "Exhibitors will not be allowed to sell goods, *except on the last day of the Fair*" (though they may receive and book orders, and all articles and animals may have the price of each attached), nor will they be permitted to call attention to their wares in a noisy or disorderly manner.

The name of the American Jersey Herd Book was stricken out.

Under the head of cattle, the second paragraph was amended so as to read:

"All three-year-old heifers in the several classes of cattle as breeding stock shall be required to have borne a calf previous to the exhibition, or the heifer cannot compete."

That the rule of the horse department shall read:

"The superintendent (in place of committee) having charge of the exhibition of horses will have possession and command of the track during the exhibition, and marshals will be at his command for all purposes of order and the enforcement of the rules."

That in the rule in class 16 the word *kept* for sporting purposes be inserted instead of *used for*, etc.

That a new rule be added in Division A as follows:

"In the several classes of thoroughbred cattle but one premium shall be awarded to an exhibitor for cattle of the same age in the same class where there is no competition in the ring."

That the rule in the sheep department be changed, compelling sheep to be shorn not earlier than April 1st, before the Fair, instead of April 20.

Mr. Wood moved to amend that part of the report referring to the time for shearing sheep, by adopting the rule in force last year. Adopted.

It was then voted to reconsider so much of the report of the Premium List Committee as refers to the entering of Berkshire swine, and the time for closing entries in Division F.

Mr. Butterfield then moved to strike out all the rule, adopted by the Premium Committee, governing the entries of Berkshire Swine, after the words "American Berkshire Record."

The motion prevailed, and the rule was made to read:

"Swine in the Berkshire class shall not be recognized as eligible to entry unless they trace to animals recorded in the "American Berkshire Record."

On motion the time for closing entries in Division F was made the same as last year, and the report, as amended, was adopted.

Mr. Baxter then moved that the report of the Committee on Rules, as amended, be adopted. Carried.

Mr. Baxter, of the committee on that part of the President's address referring to permanent location, read the report of the committee.

On motion the report was laid on the table.

Mr. Parsons then offered a resolution. After some debate, it was tabled on his own motion.

Mr. Ball offered the following, which was unanimously adopted:

WHEREAS, Through the courtesy of C. J. Whitney, the members of the Executive Board of the State Agricultural Society enjoyed much pleasure in witnessing the presentation of Bronson Howard's great play, "Baron Rudolph," and also through the courtesy of D. M. Ferry, in conducting said board through their large and flourishing establishment, which furnishes employment for seven hundred and fifty persons, known as D. M. Ferry & Co.'s seed store; therefore,

Resolved, That we express our obligations to these gentlemen for their courtesies, and also express many thanks to our friend and co-worker, Philo Parsons, who was mainly instrumental in securing the above-named pleasures.

Mr. Harrison, Superintendent of Division M, moved that the $10 premium recommended by the Viewing Committee at the last fair to Mr. Revenaugh be awarded and paid. Carried.

The committee then adjourned.

FIFTH DAY.

RUSSELL HOUSE,
Detroit, January 13, 1882.

The Executive Committee resumed its session at 9 o'clock A. M., President Fralick in the chair.

Roll called.

Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Anderson, Beckwith, Baxter, Phillips, and the secretary.

Mr. Baxter, chairman of the Committee on Permanent Location, again read the report of that committee, as follows:

Your committee would respectfully report, that in their opinion it is wise to take some action at the present meeting towards securing permanent accommodations at one or more places in the State for holding our annual fairs.

Your committee would therefore recommend that the whole matter be referred to the Business and Locating Committees jointly, with instructions to invite propositions from various cities of the State for a permanent location of the State Fair.

They would recommend further that said joint committee be instructed to submit all such propositions at the next meeting of the Executive Committee, together with such remarks and recommendations as they may deem advisable.

Your committee would further recommend that the buildings of the society be permitted to remain where they are until the matter of permanent location is decided, provided no opening of streets shall make such removal necessary and no rent is charged to the society for the grounds or right of final removal lost, subject, however, to such further action as may be taken by the committee.

Respectfully submitted,
W. J. BAXTER,
A. J. DEAN,
J. M. STERLING,
JOHN GILBERT,
G. W. PHILLIPS,
Committee.

On motion of Mr. Beckwith the report was accepted and adopted:

Mr. John McKay, Superintendent of Division E, offered the following:

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN,—The Superintendent of Division E would respectfully report:

The entries in this department numbered 258. The exhibition contained some fine poultry; in fact, all were good, and I am satisfied that there is a marked improvement in this department over former years.

There were $264 paid for premiums in the division, and as far as I was able to learn the exhibitors were well pleased with the amounts awarded.

The superintendent would thank the gentleman who acted as judge at the last Fair, for his careful labor and just decisions.

I would recommend no change in the premium list, as the present list gives perfect satisfaction to the exhibitors.

JOHN McKAY,
Superintendent.

It was moved and supported to accept and refer the report.

Mr. Chamberlain moved to amend by accepting and printing the report.

The motion as amended was adopted.

On motion the dates for holding the 34th Annual Fair were fixed as follows: September 18, 19, 20, 21, and 22.

The bonds of the Treasurer and Secretary were presented with the President's approval, and on motion referred to the Finance Committee.

Mr. Cobb offered the following, which was adopted after a lengthy debate:

Resolved, That a committee of three be appointed by the chair to take charge of the sale of stock and articles on the last day of the Fair, and to adopt such rules as they may deem necessary for the control and management of said sales.

Mr. Parsons moved to reconsider the vote taken yesterday adopting the report of the Committee on Agricultural College Farm.

The motion was lost.

Mr. Rising was, on motion, excused from further attendance at this meeting.

Mr. Hanford was, on motion, excused also.

Mr, J. Sterling offered the following preamble and resolution, which was supported by Mr. Beckwith, and unanimously adopted:

WHEREAS, Justice requires that some proper acknowledgment is due to many executive superintendents and others for the faithful and efficient manner in which they have discharged the duties of the offices incumbent upon them; especial recognition should be given to our retiring President, George W. Phillips, and the Chairman of the Business Committee, John Gilbert, the latter gentleman having devoted many months of his valuable time for the benefit of a very successful exhibition of this society at Jackson last September; therefore,

Resolved, That we express to these gentlemen our deep appreciation of the faithful and competent work performed by them, and to our retiring President, our cordial good will and confidence.

Mr. Parsons moved and it was adopted that the usual June meeting of the Society be held at Lansing during the annual meeting of the State Pioneer Society, and that the President and Secretary shall notify the executive members of the dates, etc.

On motion, Mr. Parsons's resolution laid on the table at yesterday's session was taken up, and Mr. Parsons asked leave to withdraw the same. The request was granted and resolution withdrawn.

Mr. Gilbert then submitted a resolution relative to disposing of the buildings on the Detroit fair grounds.

Mr. Baxter offered an amendment.

After a considerable discussion on the question, Mr. Parsons offered the following as a substitute which was adopted:

Resolved, That the question of settling all matters about the use of the grounds occupied by this Society for three annual fairs of 1878, '79, and '80 in the city of Detroit, and the buildings remaining thereon, and all the unsettled questions at the city of Jackson, in relation to the fair grounds and the buildings thereon, between this Society and the owners or controllers of the fair grounds there, be referred to the Business Committee, the Committee on Transportation, and the President and Treasurer of this Society with full power to settle and adjust, and finally dispose of all matters pertaining thereto, in which this Society is interested.

Mr. Ball moved, and it was supported and carried, that the whole matter of locating the next fair be referred to the same committee.

Mr. Harrison moved that the Society send reports of the Michigan State Board of Agriculture to the Indiana Board of Agriculture, and to as many other boards as they are able to supply. Carried.

The President announced as committee to take charge of sales on the last day of the fair, Messrs. Parsons, Beckwith, and Sterling.

Mr. Sterling was on motion excused and Mr. Cobb substituted in his place.

Mr. Butterfield offered the following:

Resolved, That Mr. Phillips be requested to lay the matter of furnishing reports of the State Board of Agriculture to this Society before the Secretary of the State Board of Agriculture and endeavor to obtain a sufficient number of these reports for the use of this Society.

Adopted.

The President appointed the following executive superintendents for the ensuing year:

Cattle—I. H. Butterfield, Jr.
Horses—W. H. Cobb.
Sheep—D. W. Howard.
Swine—John Lessiter.
Poultry—Charles Kipp.
Miscellaneous—A. F. Wood.
Fine Arts—C. A. Harrison, Philo Parsons.
Music, etc.—M. P. Anderson.
Needle Work and Children's Department—Miss Minnie H. Brow.
Manufactures—F. V. Smith.
Agricultural—J. L. Mitchell.
Machinery—Wm. Chamberlain.
Farm Implements—H. O. Hanford, Abel Angel.
Dairy—F. L. Reed.
Vehicles—J. Q. A. Burrington.
Forage—E. W. Rising.
Bees, Honey, etc.—W. J. Baxter.
General Superintendent—W. G. Beckwith.
Chief Marshal—A. O. Hyde.

Police—J. M. Sterling, Wm. Ball.
Gates, *Gate Keepers*—Wm. Ball, J. M. Sterling.

Mr. C. W. Greene, an old and honored member of the society, being called upon by the association, through the politeness of the chairman, for a few remarks, spoke as follows:

MR. PRESIDENT AND GENTLEMEN OF THE ASSOCIATION—I called for a few moments to pay my respects to this honorable body, but having received an invitation to remain your guest, from those I respect, honor, and love, gladly do I avail myself of the opportunity.

Though removed from your official deliberations, I am in receipt, through various avenues unknown to you, of your doings and progress.

You are too wise for flattery, and I am not weak enough to offer criticism. And yet I do rejoice that the subject of permanent location is to be discussed and examined.

Your presence calls up hallowed memories of the past, of the present, and hopes for the future. Many of our honored officers and brothers have laid down by the wayside, and rest from their labors.

Others resting upon their laurels, while you in the heyday of life and vigor of manhood, are to assume the responsibility of their absence, and burdens of to-day. May I ask, hope, even expect you to be equal to the task?

Who among us, us veterans at least, may I ask, will forget the genial faces, the wholesome, tender memories of a Hunt, Ransom, Crippen, B. Follett, Colonel Dickey—yes, Charles Dickey, the affable, genial gentleman, friendly to everybody, and beloved by all, who served in by-gone days, long and well. Of Secretaries Thomson and R. F. Johnstone, who are hardly out of sight, all who, like Bagley and Garfield have their reward, though less conspicuous, yet remembered and honored by us all.

Before me stand other veterans, now in silver locks, yet in the field ripening for the voyage that brings back no tidings. Your president, now in the chair, ex-President Beckwith, Phillips, Baxter, of revolution fame and a mound of wit and fun, that explodes with a touch or pressure of its own weight; a Gilbert, Sterling, Hyde, Dean, the indefatigable treasurer, Hanford, Rising, Cobb, and many other later members, industrially filling the places made vacant by the old ones.

Gentlemen, we build no monuments save the memory of noble deeds to them or you. May this be theirs, yours, and mine.

I congratulate you in your success, in advancing the interests of your society, your State, and common country as well.

My best wishes for your prosperity individually, and my thanks for this kind and courteous reception, which I have so much enjoyed.

It was moved and supported that Mr. Green's remarks be printed with the proceedings of this meeting. Carried.

Mr. A. S. Brooks was then invited to address the committee, and made a few remarks.

Mr. Ball, chairman of the Committee on Finance, reported that the committee had examined the bonds of the treasurer and secretary, approved the same, and recommended their acceptance.

The report was adopted.

Moved and supported that the fixing of the amount of the secretary's salary, and allowance to the treasurer for a book-keeper, be referred to the Finance Committee.

On motion, the Printing Committee was instructed to have 500 copies of the proceedings of this meeting published.

Mr. Baxter offered the following:

Resolved, That this society recognize and appreciate the great obligations they are under to the several railroad companies of this State, who have, as we are informed by the Chairman of the Transportation Committee, manifested a disposition to grant in the future, as they have in the past, all reasonable requests of this society, or its committees, and as evidenced on the part of the officers of the Michigan Central, Detroit, Grand Haven & Milwaukee, and Flint & Pere Marquette, in granting free return passes to the members of this committee for our present meeting.

Resolved, That the thanks of this committee are due and are hereby extend o the various railroad companies of the State for such favors and courtesies.

Resolved, That the thanks of this committee are hereby given to representatives of the press for their attendance and full and faithful reports of the proceedings at this session.

Adopted.

The Committee on Finance, to whom was referred the question of salary of the secretary, and the amount to be allowed the treasurer for a bookkeeper, respectfully submit the following:

That they would report in their opinion the salary of the secretary shall be $1,000 subject to that part of Rule 4 pertaining to that matter; also that the treasurer be allowed a book-keeper at a salary of $400.

All of which is respectfully submitted.

WILLIAM BALL,
M. P. ANDERSON.

Report accepted and adopted.

On motion, the committee took a recess until 2 o'clock.

AFTERNOON SESSION.

Committee resumed business at 2 o'clock.

President Fralick presiding.

Roll called and a quorum present.

Mr. Cobb asked to be excused from serving on the Committee on Sales. Granted, and on motion Mr. Gilbert was appointed in his stead.

The committee then adjourned *sine die*.

HENRY FRALICK, *President*.

J. C. STERLING, *Secretary*.

OFFICIAL LIST OF PREMIUMS AWARDED AT THE THIRTY-THIRD ANNUAL FAIR OF THE SOCIETY, HELD AT JACKSON, SEPTEMBER 19 TO 23, 1881.

DIVISION A—CATTLE.

CLASS 1.—SHORT-HORNS.

Best bull, four years old or over, A. S. Brooks, Wixom, Mich	$25 00
2d do., Wm. Ball, Hamburg	20 00
3d do., David Miller, Clarkston	15 00
Best bull, three years old, W. C. Wixom, Wixom	20 00
2d do., Edwin Upton, Leslie	15 00
3d do., D. McOmber, Hastings	10 00
Best bull, two years old, Phelps Bros., Dexter	20 00
2d do., L. L. Brooks, Novi	15 00
3d do., A. Hosmer, North Farmington	10 00
Best bull, one year old, C. S. Brooks, Brighton	15 00
2d do., A. P. Cook, Brooklyn	10 00
3d do., Amos F. Wood, Mason	5 00
Best bull calf, Amos F. Wood, Mason	12 00
2d do., James Moore, Milford	8 00
3d do., J. M. Whittaker, Lima Center	5 00

Best bull any age, Wm. Ball, Hamburg	Diploma
Best cow, four years old or over, Wm. Ball, Hamburg	$25 00
2d do., Phelps Bros., Dexter	20 00
3d do., A. S. Brooks, Wixom	10 00
Best cow, three years old, Phelps Bros., Dexter	20 00
2d do., Amos F. Wood, Mason	15 00
3d do., Thomas Shaw, Rankin	10 00
Best heifer, two years old, A. S. Brooks, Wixom	20 00
2d do., Phelps Bros., Dexter	15 00
3d do., Thomas Shaw, Rankin	10 00
Best heifer, one year old, W. C. Wixom, Wixom	15 00
2d do., Wm. Ball, Hamburg	10 00
3d do., Phelps Bros., Dexter	5 00
Best heifer calf, J. M. Whittaker, Lima Center	12 00
2d do., Phelps Bros., Dexter	8 00
3d do., James Moore, Wixom	5 00

The State Agricultural College entered for exhibition, but not for competition, a very fine herd of Short-horns, which were examined by the committee and given the following rank: Bull, three years old, 1st; cow, four years old, 2d; heifer, two years old, 2d; heifer, one year old, 2d; heifer calf, 1st; heifer calf, 2d; heifer calf, 3d.

HENRY C. MEREDITH,
WM. G. MARKHAM,
S. BROWNELL,
Viewing Committee.

CLASS 2.—DEVONS.

Best bull, four years old or over, E. T. Doney, Jackson	$25 00
2d do., A. J. Burrows, Troy	20 00
Best bull, two years old, P. K. Leech, Utica	20 00
Best bull, one year old, P. K. Leech, Utica	15 00
2d do., A. J. Burrows, Troy	10 00
Best bull calf, P. K. Leech, Utica	12 00
2d do., P. K. Leech, Utica	8 00
3d do., A. J. Burrows, Troy	5 00
Best bull, any age, E. T. Doney, Jackson	Diploma
Best cow, four years old or over, P. K. Leech, Utica	25 00
2d do., P. K. Leech, Utica	20 00
3d do., A. J. Burrows, Troy	15 00
Best cow, three years old, A. J. Burrows, Troy	20 00
2d do. P. K. Leech, Utica	15 00
Best heifer, two years old, P. K. Leech, Utica	20 00
2d do., A. J. Burrows, Troy	15 00
3d do., A. J. Burrows, Troy	10 00
Best heifer, one year old, P. K. Leech, Utica	15 00
2d do., E. T. Doney, Jackson	10 00
3d do., E. T. Doney, Jackson	5 00
Best heifer calf, P. K. Leech	12 00
2d do., A. J. Burrows	8 00
3d do., P. K. Leech	5 00

EDWIN PHELPS,
ASH. CROFOOT,
MARK HAGLE,
Viewing Committee.

CLASS 3.—HEREFORDS.

Best bull, three years old, Burleigh & Bodwell, Vassalboro, Me	$20 00
2d do., David Clark, Lapeer	15 00
Best bull, two years old, Burleigh & Bodwell, Vassalboro, Me	20 00
2d do., Edwin Phelps, Pontiac	15 00
Best bull, one year old, Burleigh & Bodwell, Vassalboro, Me	15 00
2d do., David Clark, Lapeer	10 00
Best bull calf, David Clark, Lapeer	12 00
2d do., David Clark, Lapeer	8 00
3d do., Burleigh & Bodwell, Vassalboro, Me	5 00

Best bull, any age, Burleigh & Bodwell, Vassalboro	Diploma.
Best cow, four years old or over, Burleigh & Bodwell, Vassalboro	$25 00
2d do., Burleigh & Bodwell, Vassalboro	20 00
3d do., G. & F. Parsons, Wellington, O	15 00
Best heifer, three years old, David Clark, Lapeer	20 00
2d do., G. & F. Parsons, Wellington, O	15 00
3d do., Burleigh & Bodwell, Vassalboro	10 00
Best heifer, two years old, Edwin Phelps, Pontiac	20 00
2d do. G. & F. Parsons, Wellington	15 00
Best heifer, one year old, Burleigh & Bodwell, Vassalboro	15 00
2d do., Burleigh & Bodwell, Vassalboro	10 00
3d do., David Clark, Lapeer	5 00
Best heifer calf, David Clark, Lapeer	12 00
2d do., Edwin Phelps, Pontiac	8 00
3d do., Burleigh & Bodwell, Vassalboro	5 00

F. HART SMITH,
MARK HAGLE,
D. S. HOLCOMB,
Viewing Committee.

CLASS 4—AYRSHIRES.

Best bull four years old or over, T. E. Wight, Milbury, O	$25 00
2d do., Charles R. Coryell, Jonesville	20 00
Best bull two years old, Charles R. Coryell, Jonesville	20 00
2d do., J. S. Rogers, Orchard Lake	15 00
Best bull calf, J. S. Rogers, Orchard Lake	12 00
2d do., T. E. Wight, Millbury, O	8 00
3d do, T. E. Wight, Millbury, O	5 00
Best bull any age, T. E. Wight, Millbury, O	Diploma.
cow four years old or over, J. S. Rogers, Orchard Lake	25 00
2d do., Charles R. Coryell, Jonesville	20 00
3d do., T. E. Wight, Millbury, O	15 00
Best cow three years old, T. E. Wight, Millbury, O	20 00
heifer two years old, T. E. Wight, Millbury, O	20 00
2d do., J. S. Rogers, Orchard Lake	15 00
Best heifer one year old, J. S. Rogers, Orchard Lake	15 00
2d do., T. E. Wight, Millbury, O	10 00
Best heifer calf, J. S. Rogers, Orchard Lake	12 00

RICHARD B. CARUSS,
DAVID CLARK,
WM. SOMERVILLE,
Viewing Committee.

CLASS 5—JERSEYS.

Best four years old or over, Bates & Martin, Grand Rapids	$25 00
bull two years old, W. J. G. Dean, Hanover	20 00
2d do., A. J. King, Elyria, O	15 00
3d do., James Taylor, Kalamazoo	10 00
Best bull one year old, Howard Kingman, Battle Creek	15 00
2d do., Bates and Martin, Grand Rapids	10 00
3d do., Howard Kingman, Battle Creek	5 00
Best bull calf, Bates & Martin, Grand Rapids	12 00
2d do., W. J. G. Dean, Hanover	8 00
3d do., Bates & Martin, Grand Rapids	5 00
Best bull any age, Howard Kingman, Battle Creek	Diploma.
cow four years old or over, Bates & Martin, Grand Rapids	25 00
2d do., A. J. King, Elyria, O	20 00
3d do., James Taylor, Kalamazoo	15 00
Best cow three years old, A. J. King, Elyria, O	20 00
2d do., Howard Kingman, Battle Creek	15 00
3d do, W. J. G. Dean, Hanover	15 00
Best heifer two years old, Howard Kingman, Battle Creek	20 00
2d do., W. J. Dean, Hanover	15 00
3d do., A. J. King, Elyria, O	10 00

Best heifer one year old, A. J. King, Elyria, O	$15 00
2d do., W. J. G. Dean, Hanover	10 00
3d do., W. J. G. Dean, Hanover	5 00
Best heifer calf, Howard Kingman, Battle Creek	12 00
2d do., W. J. G. Dean, Hanover	8 00
3d do., A. J. King, Elyria, O	8 00

JOHN G. ENGLISH,
LEONIDAS S. SCRANTON,
MARK HAGLE.
Viewing Committee.

CLASS 6—GALLOWAYS.

Best bull, four years old or over, R. B. Caruss, St. Johns	$25 00
bull, one year old, Burleigh & Bodwell, Vassalboro	15 00
bull calf, Burleigh & Bodwell, Vassalboro	12 00
cow, four years old or over, Burleigh & Bodwell, Vassalboro	25 00
2d do., R. B. Caruss, St. Johns	20 00
3d do., R. B. Caruss, St. Johns	15 00
Best cow, three years old, R. B. Caruss, St. Johns	20 00
heifer, two years old, Burleigh & Bodwell, Vassalboro	20 00
2d do., Burleigh & Bodwell, Vassalboro	15 00
3d do., R. B. Caruss, St. Johns	10 00
Best heifer, one year old, Burleigh & Bodwell, Vassalboro	15 00
2d do., Burleigh & Bodwell, Vassalboro	10 00
3d do., R. B. Caruss, St. Johns	5 00
Best heifer calf, R. B. Caruss, St. Johns	12 00
2d do., R. B. Caruss, St. Johns	8 00

EDWIN PHELPS,
MARK HAGLE,
D. S. HOLCOMB.
Viewing Committee.

CLASS 7—HOLSTEINS.

Best bull, four years old or over, A. Underwood, Addison	$25 00
bull, three years old, W. A. Rowley, Mt. Clemens	20 00
2d do., Phelps & Seeley, Pontiac	15 00
3d do., Smalley Bros., Concord	10 00
Best bull, two years old, A. Underwood, Addison	20 00
2d do., W. J. Rogers, Pittsfield, O	15 00
Best bull, one year old, E. B. Ward, Grand Rapids	15 00
2d do., J. O. Beal & Bro., Rollin	10 00
3d do., Smalley Bros., Concord	5 00
Best bull calf, Smalley Bros., Concord	12 00
2d do., Phelps & Seeley, Pontiac	8 00
3d do., A. Underwood, Addison	5 00
Best bull of any age, A. Underwood, Addison	Diploma.
cow, four years old or over, A. Underwood, Addison	25 00
2d do., Smalley Bros., Concord	20 00
3d do., Stone & Biggs, Hastings	15 00
Best cow., three years old, Phelps & Seeley, Pontiac	20 00
2d do., A. Underwood, Addison	15 00
3d do, Phelps & Seeley, Pontiac	10 00
Best heifer, two years old, W. A. Rowley, Mt. Clemens	20 00
2d do., A. Underwood, Addison	15 00
3d do., A. Underwood, Addison	10 00
Best heifer, one year old, Phelps & Seeley, Pontiac	15 00
2d do., Phelps & Seeley, Pontiac	10 00
3d do., Smalley Bros., Concord	5 00
Best heifer calf, W. A. Rowley, Mt. Clemens	12 00
2d do., A. Underwood, Addison	8 00
3d do., Phelps & Seeley, Pontiac	5 00

W. K. SETON,
G. M. SHATTUCK,
J. V. N. GREGORY.
Viewing Committee.

CLASS 8—GRADE CATTLE.

Best cow, four years old or over, A. Hosmer, N. Farmington	$20 00
2d do., G. A. Smith, Somerset	10 00
3d do., David Miller, Clarkston	5 00
Best heifer, three years old, A. Hosmer, N. Farmington	15 00
2d do., David Miller, Clarkston	7 00
3d do., Moore & Kelley, Ypsilanti	4 00
Best heifer two years old, Amos F. Wood, Mason	10 00
2d do., David Miller, Clarkston	5 00
3d do., A. Hosmer, N. Farmington	3 00
Best heifer one year old, A. Hosmer, N. Farmington	8 00
2d do., David Miller, Clarkston	5 00
3d do., David Miller, Clarkston	3 00
Best heifer calf, A. Hosmer, N. Farmington	5 00
2d do., David Miller, Clarkston	3 00
3d do., David Miller, Clarkston	2 00
Best herd of Grade cattle, A. Hosmer, N. Farmington	20 00
2d do., David Miller, Clarkston	10 00
3d do., Amos F. Wood, Mason	5 00

JOHN McKAY,
CHAS. FISHBECK,
HENRY D. REIDER,
Viewing Committee.

CLASS 9—WORKING OXEN AND STEERS.

Best yoke of working oxen, five years old or over, A. Hosmer, N. Farmington	$25 00
2d do., Geo. J. Townley & Son, E. Springport	20 00
3d do., E. T. Doney, Jackson	15 00
Best yoke of steers four years old, Oscar Cline, Sherwood	20 00
2d do., Abram Hart, Jersey	15 00
Best yoke of steers three years old, Warren Case, Napoleon	15 00
Best yoke of steers two years old, David Miller, Clarkston	10 00
2d do., Amos F. Wood, Mason	6 00
Best yoke of steers one year old, J. L. Harris, Marshall	8 00
2d do., David Miller, Clarkston	5 00
3d do., Amos F. Wood, Mason	3 00

JOHN McKAY,
CHAS. FISHBACK,
HENRY D. REIDER,
Viewing Committee.

CLASS 10—FAT CATTLE.

Best steer four years old and under five, G. A. Smith, Somerset	$15 00
2d do., G. A. Smith, Somerset	10 00
3d do., O. S. Walcott, Concord	5 00
Best steer three years old, G. A. Smith, Somerset	12 00
Best steer two years old, A. Hosmer, N. Farmington	10 00
2d do., A. Hosmer, N. Farmington	6 00
3d do., O. S. Walcott, Concord	4 00
Best steer one year old, Geo. J. Townley & Son, E. Springport	8 00
2d do., Geo. J. Townley & Son, Springport	5 00
3d do., A. Hosmer, N. Farmington	3 00
Best heifer four years old and under five, Phelps Bros., Dexter	15 00
Best heifer three years old, J. M. Whittaker, Lima Center	15 00
2d do., Phelps Bros., Dexter	8 00
3d do., David Miller, Clarkston	4 00
Best herd of fat cattle, G. A. Smith, Somerset	30 00
2d do., A. Hosmer, N. Farmington	20 00

WILLIAM WRIGHT,
MARK HAGLE,
A. L. STILES,
Viewing Committee.

CLASS 11—HERDS.

Best herd of Shorthorns, Phelps Bros., Dexter	$30 00
2d do., A. S. Brooks, Wixom	20 00

A. G. TAYLOR,
G. A. SMITH,
JOHN McKAY,
Viewing Committee.

Best herd of Devons, P. K. Leech, Utica	$30 00
2d do., A. J. Burrows, Troy	20 00

WM. WRIGHT,
GEO. W. STUART,
A. G. TAYLOR,
Viewing Committee.

Best herd of Herefords, Burleigh & Bodwell, Vassalboro	$30 00
2d do., David Clark, Lapeer	20 00

WM. WRIGHT,
GEO. W. STUART,
MARK HAGLE,
Viewing Committee.

Best herd of Ayrshires, T. E. Wight, Millbury, O.	$30 00
2d do., J. S. Rogers, Orchard Lake	20 00

WM. WRIGHT,
GEO. W. STUART,
MARK HAGLE,
Viewing Committee.

Best herd of Jerseys, W. J. G. Dean, Hanover	$30 00
2d do., A. J. King, Elyria, O.	20 00

WM. WRIGHT,
GEO. W STUART,
MARK HAGLE,
Viewing Committee.

Best herd of Galloways, Burleigh & Bodwell, Vassalboro	$30 00
2d do., R. B. Caruss, St. Johns	20 00

WM. WRIGHT,
GEO. W. STUART,
MARK HAGLE,
Viewing Committee.

Best herd of Holsteins, A. Underwood, Addison	$30 00
2d do., Phelps & Seeley, Pontiac	20 00

WM. WRIGHT,
GEO. W. STUART,
MARK HAGLE,
Viewing Committee.

A special premium for a herd of Shorthorns was awarded to John S. Steel, Anderson, O.	$25 00

DIVISION B—HORSES.

CLASS 12—THOROUGHBREDS.

Best stallion, four years old or over, Kelly & Garvy, Saginaw	$30 00
Best mare, four years old or over, without colt, William Milton, Colon	15 00
2d do., John M. Matthewson, Lowell	12 00
Best gelding, two years old, Charles Burnham, Fulton	8 00

B. VOSBURG,
C. E. MORRISON,
B. F. RANSOM.
Viewing Committee.

CLASS 13—HORSES OF ALL WORK.

Best stallion, five years old or over, E. H. Lyons, St. Johns	$30 00
2d do., W. H. Smith & Bro., Hillsdale	20 00
3d do., W. Harris, Francisco	10 00
Best stallion, four years old, A. M. James, Arland	25 00
2d do., Frank W. Smith, Watervleit	15 00
3d do., C. W. Riggs, Francisco	10 00
Best stallion, three years old, E. Hasbrouck, Marshall	20 00
2d do., H. Tinlin, Eaton Rapids	15 00
3d do., A. M. James, Arland	10 00
Best stallion, two years old, B. F. Miller, South Riley	12 00
2d do., E. H. Lyons, St. Johns	10 00
3d do., David Plowman, DeWitt	8 00
Best stallion, one year old, E. H. Lyons, St. Johns	10 00
2d do., L. M. Lyons, St. Johns	8 00
3d do., E. Woodman, Paw Paw	5 00
Best stallion colt, H. F. Warren, Fowler	8 00
2d do., David Plowman, DeWitt	5 00
3d do., A. L. Strong, Grass Lake	3 00
Best brood mare, four years old or over, with foal by her side, B. F. Miller, South Riley	20 00
2d do., E. H. Lyons, St. Johns	15 00
3d do., S. B. Kerr, Somerset Center	10 00
Best mare, four years old or over, without colt, Henry Haynes, Leoni	12 00
2d do., D. S. Holcomb, Jackson	8 00
Best mare, three years old, E. Hasbrouck, Marshall	10 00
2d do., Eli Fisk, Tompkins	8 00
3d do., Eli Fisk, Tompkins	4 00
Best mare, two years old, E. Woodman, Paw Paw	8 00
2d do., Robert Gould, Ceresco	5 00
3d do., H. F. Warren, Fowler	3 00
Best filly, one year old, Charles A. Davis, Albion	7 00
2d do., B. F. Miller, South Riley	5 00
3d do., A. L. Strong, Grass Lake	3 00
Best filly colt, E. Woodman, Paw Paw	5 00
2d do., Milton Reed, Paw Paw	3 00
Best gelding, five years old or over, C. W. Riggs, Francisco	15 00
2d do., James D. Perry, Redford	10 00
3d do., C. W. Riggs, Francisco	5 00
Best gelding, four years old, James C. Deyo, Jackson	12 00
2d do., Allen Lyon, Jackson	8 00
3d do., H. H. Tucker, Concord	5 00
Best gelding, three years old, Eli Smith, Grass Lake	10 00
2d do., Allen Lyon, Jackson	8 00
3d do., N. H. Desham, Quincy	5 00
Best gelding, one year old, James D. Perry, Redford	8 00
gelding, one year old, Charles A. Davis, Albion	6 00
Best pair of matched horses of all work, five years old or over, speed, size, style, and fitness for carriage or farm work to be points; weight of each horse to be not less than 1,100 pounds, Morris Knapp, Jackson	30 00
2d do., Myron Snyder, Duck Lake	20 00
3d do., Allen Dunning, Beech	10 00
Best pair of four year old horses matched in color, speed, size, style, and fitness for carriage or farm work, Robert Gould, Ceresco	25 00
2d do., F. H. Hall, Bath	15 00
Best pair of matched horses for all work, three years old, A. Phillips, Dansville	15 00

C. E. MORRISON,
WM. BAIR,
F. W. DICKEY.
Viewing Committee.

CLASS 14—ROADSTERS.

Best stallion, five years old or over, W. W. Starkey, Fowlerville	$30 00
2d do., William Mellon, Colon	20 00
3d do., John Abbott	10 00
Best stallion, four years old, F. Messenger, Hillsdale	25 00
2d do., Thomas Blakely, Lambertville	15 00
Best stallion, three years old, John L. Blake, Tekonsha	20 00
2d do., M. Osborn, Homer	15 00
3d do., James Coleson, Stockbridge	10 00
Best gelding, five years old or over, H. H. Tucker, Concord	15 00
2d do., D. N. Tripp, Coldwater	10 00
3d do., William Mellon, Colon	5 00
Best gelding, four years old, A. O. Austin, Jackson	12 00
2d do., John G. Carter, Jackson	8 00
3d do., Robert Gould, Ceresco	4 00
Best gelding, three years old, Clement Bros., Colon	10 00
mare, four years old or over, without colt, A. C. Fisk, Coldwater	12 00
2d do., A. C. Fisk, Coldwater	8 00
3d do., C. O. Bill, Tecumseh	5 00
Best mare, three years old, A. C. Fisk, Coldwater	10 00
2d do., John Conley, Marshall	6 00
3d do,, D. N. Tripp, Coldwater	4 00

B. VOSBURG,
B. F. RANSOM,
A. L. STEBBINS.
Viewing Committee.

CLASS 15—BREEDERS' STOCK.

Best stallion, two years old, A. L. Smith, Girard	$12 00
2d do., Andrew Miller, Dexter	8 00
3d do., Henry Haynes, Leoni	5 00
Best stallion, one year old, John Harris, Pinckney	10 00
2d do., Allen Lyon, Jackson	6 00
3d do., B. H. Warren, Fowler	4 00
Best stallion colt, Dr. W. A. Gibson, Jackson	7 00
2d do., Mark H. Ray, Concord	5 00
3d do., E. H. Lyons, St. Johns	3 00
Best gelding, two years old, J. L. Harris, Marshall	8 00
2d do., Hyde & Rosecrantz, Marshall	5 00
Best brood mare, four years old or over, with foal by her side, E. H. Lyons, St. Johns	20 00
2d do., John G. Carter, Jackson	15 00
3d do., John G. Carter, Jackson	10 00
Best mare, two years old, R. B. Donelson, Pontiac	8 00
2d do., Robert Gould, Ceresco	5 00
3d do., Hyde & Rosecrantz, Marshall	3 00
Best mare, one year old, N. J. Kellog & Son, Albion	7 00
2d do., Francis Hawley, Horton	5 00
3d do., E. H. Lyon, St. Johns	2 00
Best mare colt, Charles A. Davis, Albion	5 00
2d do., E. H. Lyon, St. Johns	3 00
3d do., J. W. Parkhurst, Augusta	2 00

C. E. MORRISON,
F. W. DICKEY,
WM. BAIR,
Viewing Committee.

CLASS 16—GENTS' DRIVING HORSES TO ROAD WAGON.

Best pair driving horses, not used for sporting purposes, to be exhibited under the direction of the superintendent in charge of this department, W. F. Cowhan, Jackson	$30 00
2d do., M. W. Robinson, Jackson	20 00
3d do., J. W. Hewitt, Jackson	10 00
Best single gelding or mare, five years old or over, J. C. Deyo, Jackson	30 00
2d do., C. C. Pond, Jackson	20 00
3d do., C. D. Bills, Tecumseh	10 00

Best single mare or gelding, four years old, H. H. Tucker, Concord	$20 00
2d do., M. J. Bennett, Mason	15 00
3d do., A. B. Donelson, Pontiac	10 00

B. VOSBURG,
B. F. RANSOM,
A. L. STEBBINS,
Viewing Committee.

CLASS 17—DRAUGHT HORSES.

Best stallion, five years old or over, W. H. Smith & Bros., Hillsdale	$30 00
2d do., Green & Powell Bros., Olivet	20 00
3d do., Jonathan H. Carter, Detroit	10 00
Best stallion, four years old, J. Shaw, Leslie	25 00
2d do., Galvin Fellows, Mason	15 00
3d do., John Turnbell, Owosso	10 00
Best stallion, three years old, Green & Powell Bros., Olivet	20 00
2d do., W. H. Dancer, Horton	12 00
3d do., S. H. Godfrey, Parma	8 00
Best stallion, two years old, D. McOmber, Hastings	10 00
2d do., F. A. Hull, Bath	6 00
3d do., R. B. Caruss, St. Johns	4 00
Stallion, one year old, E. Woodman, Paw Paw, 2d	5 00
Best stallion colt, E. Woodman, Paw Paw	5 00
2d do., F. H. Hall, Bath	3 00
Best mare, four years old or over, Geo. Parrat, Mt. Clemens	20 00
2d do., E. B. Ward, Grand Rapids	12 00
Best mare, three years old, Parsons & Baldwin, Watervleit	12 00
2d do., E. Woodman, Paw Paw	8 00
Best filly colt, Geo. Parrat, Mt. Clemens	5 00
2d do., Parsons & Baldwin, Watervleit	3 00
3d do., F. H. Hall, Bath	2 00
Best pair mares or geldings, four years old or over, Isaac Mills, Clyde	30 00
2d do., Sam'l Blackwood, South Lyon	20 00

C. E. MORRISON,
WM. BAIR,
F. W. DICKEY,
Viewing Committee.

CLASS 18—CARRIAGE AND BUGGY HORSES.

Best pair of carriage matched horses, sixteen hands or over, and five years old or over, Wm. Peacock, Leslie	$30 00
2d do., L. Sherwood, Ypsilanti	20 00
3d do., John L. Blake, Tekonsha	10 00
Best pair of matched carriage horses, sixteen hands or over, and four years old, James C. Deyo, Jackson	25 00
2d do., John V. Smith, Grass Lake	15 00
Best pair of matched carriage horses, under sixteen hands, four years old or over, M. W. Robinson, Jackson	25 00
2d do., James C. Deyo, Jackson	15 00
3d do., Philo J. Hall, Jackson	10 00
Best pair of matched carriage horses, three years old, Wright Hawkins, Jackson	20 00
2d do., E. L. Mills, Tecumseh	12 00
3d do., J. Terpening, Addison	8 00
Best single carriage or buggy horse, four years old or over, J. C. Deyo, Jackson	12 00
2d do., John E. Blake, Tekonsha	8 00
3d do., Frank E. Ives, Unadilla	4 00
Best single carriage or buggy horse, three years old, J. C. Deyo, Jackson	10 00
2d do., J. G. Carter, Jackson	7 00
3d do., Henry Hayne, Leoni	3 00

B. VOSBURG,
B. F. RANSOM,
A. L. STEBBINS,
Viewing Committee.

CLASS 19—FOR MICHIGAN HORSES, ROADSTERS AND THOROUGH-BREDS.

Best stallion, five years old or over, A. H. Cutter, Parma	$100 00
2d do., A. B. Donelson, Pontiac	75 00
3d do., Dr. W. A. Gibson, Jackson	50 00
Best stallion, four years old, S. L. Perrin, Parkville	75 00
Best stallion, three years old, J. L. Blake, Tekonsha	30 00
2d do., N. H. Desham, Quincy	20 00
3d do., H. H. Tucker, Concord	10 00
Best stallion, two years old, A. C. Fisk, Coldwater	20 00
2d do., H. L. Wixom, Coldwater	15 00
3d do., A. B. Donelson, Pontiac	10 00

B. VOSBURG,
B. F. RANSOM,
F. W. DICKEY,
Viewing Committee.

CLASS 20—MICHIGAN HORSES, MARES, AND GELDINGS.

Best mare or gelding five years old or over, W. F. Cowhan, Jackson	$100 00
2d do., A. C. Fisk, Coldwater	75 00
3d do., Wm. Mellon, Colon	50 00
Best mare or gelding four years old, H. L. Wixom, Coldwater	75 00
2d do., Jas. E. Hatch, Horton	50 00
3d do., A. J. Barber, Mason	25 00
Best mare or gelding three years old, W. Mellon, Colon	30 00
2d do., B. S. Tibbits, Coldwater	20 00
3d do., A. C. Fisk, Coldwater	10 00
Best mare or gelding two years old, A. J. Bennett, Mason	20 00
2d do., D. B. Hibbard, Jackson	15 00
3d do., W. H. Warren, Fowler	10 00

THOROUGHBRED STALLIONS, MARES, AND GELDINGS.

Best stallion any age, Dr. Orr, Caro	$75 00
2d do., J. M. Mathewson, Lowell	50 00
Best mare or gelding any age over three years, Kelly & Garvey, Saginaw	50 00
2d do., Dr. Orr, Caro	30 00
3d do., Chas. Burnham, Fulton	20 00

B. VOSBURG,
B. F. RANSOM,
A. L. STEBBINS,
Viewing Committee.

CLASS 21—SWEEPSTAKES FOR STALLIONS WITH SIX COLTS OF HIS OWN GET.

Best of all work stallion, E. H. Lyon, St. Johns	$30 00
2d do., Reed & Cranch, S. Jackson	15 00
Best roadster stallion, W. W. Starkey, Fowlerville	30 00
2d do., R. B. Donelson, Pontiac	15 00
Best draught stallion, E. Woodman, Paw Paw	30 00

B. VOSBURG,
B. F. RANSOM,
A. L. STEBBINS,
Viewing Committee.

DIVISION C—SHEEP.

CLASS 22—THOROUHBRED AMERICAN MERINOS.

Best ram three years old or over, C. M. Fellows, Manchester	$20 00
2d do., Wm. Ball, Hamburg	15 00
3d do., Thos. Gundrie, Grand Blanc	10 00
Best ram two years old, L. W. & O. Barnes, Byron	20 00
2d do., Jas. W. Dey, Deveraux	15 00
3d do., L. W. & O. Barnes, Byron	10 00
Best ram one year old, James W. Dey, Deveraux	15 00
2d do., J. H. Thompson, Grand Blanc	12 00
3d do., Wm. Ball, Hamburg	8 00

Best ram lamb, E. Kellogg, Brighton	$12 00
2d do., L. W. & O. Barnes, Byron	10 00
3d do., E. Kellogg, Brighton	5 00
Best two ewes three years old or over, Wm. Ball, Hamburg	20 00
2d do., J. M. Moore, Brooklyn	15 00
3d do., D. P. Dewey, Grand Blanc	10 00
Best two ewes two years old, Van Gieson Bros., Clinton	20 00
2d do., S. S. Brewster, Hanover	15 00
3d do., D. P. Dewey, Grand Blanc	10 00
Best two ewes one year old, James W. Dey, Deveraux	15 00
2d do., Van Gieson Bros., Clinton	12 00
3d do., Wm. Ball, Hamburg	8 00
Best two ewe lambs, Van Gieson Bros., Clinton	12 00
2d do., L. W. & O. Barnes, Byron	10 00
3d do., E. Kellogg, Brighton	5 00

E. W. HARDY,
GEO. S. PIERSON,
S. B. HAMMOND,
Viewing Committee.

CLASS 23—FINE WOOL GRADES.

Best two ewes three years old or over, Van Gieson Bros., Clinton	$15 00
2d do., L. W. & O. Barns, Byron	10 00
3d do., J. M. Moore, Brooklyn	5 00
Best two ewes twa years old, Van Gieson Bros., Clinton	12 00
2d do., T. H. Lyons, Eaton Rapids	8 00
3d do., E. Driggs, Palmyra	5 00
Best two ewes one year old, Van Gieson Bros., Clinton	10 00
2d do., Van Gieson Bros., Clinton	6 00
3d do., L. W. & O. Barnes, Byron	4 00
Best two ewe lambs, Van Gieson Bros., Clinton	8 00
2d do., L. W. & O. Barnes, Byron	5 00
3d do., R. D. M. Edwards, Napoleon	3 00

FRED C. WOOD,
A. M. WILLETT,
Viewing Committee.

CLASS 24—SOUTHDOWNS.

Best ram two years old or over, John Lessiter, Jersey	$15 00
2d do., T. B. Bennington, La Porte, O	10 00
3d do., E. Driggs, Palmyra	6 00
Best ram one year old, T. B. Bennington, La Porte, O.	12 00
2d do., T. B. Bennington, La Porte, O	8 00
3d do., John Lessiter, Jersey	5 00
Best ram lamb, John Lessiter, Jersey	10 00
2d do., Moore & Kelly, Ypsilanti	8 00
3d do., A. B. West, Attica	4 00
Best two ewes two years old or over, A. B. West, Attica	15 00
2d do., T. B. Bennington, La Porte, O	10 00
3d do., E. Driggs, Palmyra	6 00
Best two ewes one year old, E. Driggs, Palmyra	10 00
2d do., John Lessiter, Jersey	8 00
3d do., A. B. West, Attica	5 00
Best two ewe lambs, John Lessiter, Jersey	10 00
2d do., John Lessiter, Jersey	6 00
3d do , T. B. Bennington, La Porte, O	4 00

R. B. CARUSS,
C. C. POND,
R. CLARK,
Viewing Committee.

CLASS 25.—ALL MIDDLE WOOL SHEEP, OTHER THAN SOUTH DOWNS.

Best ram, two years old or over, C. H. Bellinger, Atwater, O	$15 00
2d do., T. B. Bennington, La Porte, O	10 00
3d do., S. H. Todd, Wakeman, O	6 00

Best ram, one year old, T. B. Bennington, La Porte, O	$12 00
2d do., C. W. Riggs, Francisco	8 00
3d do., Moore & Kelly, Ypsilanti	5 00
Best ram lamb, T. B. Bennington, La Porte, O	10 00
2d do., S. H. Todd, Wakeman, O	6 00
3d do., John Lessiter, Jersey	4 00
Best two ewes, two years old or over, T. B. Bennington, La Porte, O	15 00
2d do., T. B. Bennington, La Porte, O	10 00
3d do., S. H. Todd, Wakeman, O	6 00
Best two ewes, one year old, T. B. Bennington, La Porte, O	12 00
2d do., C. H. Bellinger, Atwater, O	8 00
3d do., T. B. Bennington, La Porte, O	5 00
Best two ewe lambs, Moore & Kelly, Ypsilanti	10 00
2d do., S. H. Todd, Wakeman, O	6 000
3d do., Moore & Kelly, Ypsilanti	4 00

R. B. CARUSS,
A. B. WEST,
R. CLARK,
Viewing Committee.

CLASS 26—LEICESTERS.

Best ram, two years old or over, John McDonald, Horton	$15 00
2d do., John McDonald, Horton	10 00
3d do., Amos F. Wood, Mason	6 00
Best ram, one year old, E. Driggs, Palmyra	12 00
2d do., E. Driggs, Palmyra	8 00
3d do., Amos F. Wood, Mason	5 00
Best ram lamb, John McDonald, Horton	10 00
2d do., Amos F. Wood, Mason	6 00
3d do., E. Driggs, Palmyra	4 00
Best two ewes, two years old or over, Amos F. Wood, Mason	15 00
2d do., E. Driggs, Palmyra	10 00
3d do., John McDonald, Horton	6 00
Best two ewes, one year old, John McDonald, Horton	12 00
2d do., Amos F. Wood, Mason	8 00
3d do., E. Driggs, Palmyra	5 00
Best two ewe lambs, A. P. Cook, Brooklyn	10 00
2d do., Amos F. Wood, Mason	6 00
3d do., Amos F. Wood, Mason	4 00

HARVEY WILSON,
JAS. TAYLOR,
B. CLARK,
Viewing Committee.

CLASS 27—COTSWOLDS AND OTHER LONG-WOOLED SHEEP.

Best ram, two years old or over, C. H. Ballinger, Atwater, Ohio	$15 00
2d do., John McDonald, Horton	10 00
3d do., Frank Wilson, Jackson	6 00
Best ram, one year old, Frank Wilson, Jackson	12 00
2d do., C. H. Bellinger, Atwater, Ohio	8 00
3d do., E. Driggs, Palmyra	5 00
Best ram lamb, C. H. Bellinger, Atwater, Ohio	10 00
2d do., Frank Wilson, Jackson	8 00
3d do., E. Driggs, Palmyra	4 00
Best two ewes, two years old or over, Frank Wilson, Jackson	15 00
2d do., C. H. Bellinger, Atwater, Ohio	10 00
3d do., Frank Wilson, Jackson	6 00
Best two ewes, one year old, C. H. Bellinger, Atwater, Ohio	12 00
2d do., Frank Wilson, Jackson	8 00
3d do., C. H. Bellinger, Atwater, Ohio	5 00
Best two ewe lambs, E. Driggs, Palmyra	10 00
2d do., C. H. Bellinger, Atwater, Ohio	6 00
3d do., Frank Wilson, Jackson	4 00

HARVEY WILSON,
JAS. TAYLOR,
B. CLARK,
Viewing Committee.

CLASS 28—GRADE COARSE-WOOLED EWES.

Best two ewes, two years or over, Moore & Kelly, Ypsilanti	$12 00
2d do., Moore & Kelly, Ypsilanti	5 00
Best two ewes, one year old, Moore & Kelly, Ypsilanti	10 00
2d do., Moore & Kelly, Ypsilanti	6 00
Best two ewe lambs, Moore & Kelly, Ypsilanti	5 00
2 do., Moore & Kelly, Ypsilanti	3 00

H. WILSON,
JAS. TAYLOR,
B. CLARK,
Viewing Committee.

CLASS 29—FAT SHEEP.

Best pen of middle-wooled sheep, T. B. Bennington, La Porte, Ohio	$12 00
2d do., John Lessiter, Jersey	8 00
3d do., E. Driggs, Palmyra	5 00
Best pen long-wooled sheep, Frank Wilson, Jackson	12 00
2d do., Amos F. Wood, Mason	8 00
3d do., John McDonald, Horton	5 00
Best pen grade fat sheep, M. K. Crafts, Grass Lake	12 00
2d do., Frank Wilson, Jackson	8 00
3d do., John McDonald, Horton	5 00

R. B. CARUSS,
B. CLARK,
C. C. POND,
Viewing Committee.

DIVISION D.—SWINE.

OLASS 30—BERKSHIRES.

Best boar, two years old or over, William Gunn, Jackson	$12 00
2d do., Wm. Gunn, Jackson	8 00
3d do., Wm. N. Adams, Jackson	4 00
Best boar, one year old, N. A. Clapp, Wixom	10 00
2d do., Wm. Gunn, Jackson	6 00
3d do., N. A. Clapp, Wixom	3 00
Best brood sow, two years old or over, Geo. J. Townley & Son, E. Springport	12 00
2d do., George W. Prescott, Grand Rapids	8 00
3d do., Wm. Gunn, Jackson	4 00
Best sow, one year old, N. A. Clapp, Wixom	10 00
2d do., Wm. Gunn, Jackson	6 00
3d do., Wm. Gunn, Jackson	3 00
Best pen of pigs, not less than four in number nor over ten months old, Geo. J. Townley & Son, E. Springport	10 00
2d do., Wm. Gunn, Jackson	6 00
3d do., N. A. Clapp, Wixom	3 00
Best boar, any age, George W. Prescott, Grand Rapids	Diploma.

ESSEX.

Best boar, two years old or over, R. B. Caruss, St. Johns	$12 00
2d do., T. H. Lyon, Eaton Rapids	8 00
3d do., E. T. Doney, Jackson	6 00
Best boar, one year old, Frank Wilson, Jackson	10 00
2d do., E. T. Doney, Jackson	6 00
3d do., A. Chandler, Jerome	3 00
Best brood sow, two years old or over, Frank Wilson, Jackson	12 00
2d do., Patrick Millett, Howell	8 00
3d do., M. L. & F. A. Ray, Concord	4 00
Best sow, one year old, M. L. & F. A. Ray, Concord	10 00
2d do., E. T. Doney, Jackson	6 00
3d do., Patrick Millett, Howell	3 00
Best pen of pigs not less than four in number nor over ten months old, M. L. & F. A. Ray, Concord	10 00
2d do., P. Millett, Howell	6 00
3d do., T. H. Lyon, Eaton Rapids	3 00
Best boar, any age, R. B. Caruss, St. Johns	Diploma.

SUFFOLKS AND SMALL YORKSHIRES.

Best boar, two years old or over, L. B. Bennington, La Porte, O	$12 00
2d do., Frank Wilson, Jackson	8 00
3d do., Frank Wilson, Jackson	4 00
Best boar, one year old, A. Chandler, Jerome	10 00
2d do., Ganson & Harris, Fenton	6 00
3d do., Frank Wilson, Jackson	3 00
Best brood sow, two years old or over, Frank Wilson, Jackson	12 00
2d do., Frank Wilson, Jackson	8 00
3d do., Ganson & Harris, Fenton	4 00
Best sow, one year old, Frank Wilson, Jackson	10 00
2d do., Frank Wilson, Jackson	6 00
3d do., Ganson & Harris, Fenton	3 00
Best pen of pigs, not less than four in number nor over ten months old, Frank Wilson, Jackson	10 00
2d do., Ganson & Harris, Fenton	6 00
3d do., Ganson & Harris, Fenton	4 00
Best boar, any age, Frank Wilson, Jackson	Diploma.

POLAND-CHINAS.

Best boar, two years old or over, L. W. & O. Barns, Byron	$12 00
Best sow, two years old or over, S. H. Todd, Wakeman, O	12 00
2d do., L. W. & O. Barns, Byron	8 00
3d do., L. W. & O. Barns, Byron	4 00
Best sow, one year old, L. W. & O. Barns, Byron	10 00
2d do., J. M. Sharp, Jackson	6 00
Best pen of pigs, not less than four in number nor more than ten months old, S. H. Todd, Wakeman, O	10 00
2d do., L. W. & O. Barns, Byron	6 00
3d do., L. W. & O. Barns, Byron	3 00
Best boar of any age, L. W. & O. Barns, Byron	Diploma.

CHESTER WHITE AND LARGE YORKSHIRE.

Best boar, two years old or over, S. H. Todd, Wakeman, O	$12 00
2d do., Richardson & Reed, Jackson	8 00
Best boar, one year old, S. A. Todd, Wakeman, O	10 00
2d do., Richardson & Reed, Jackson	6 00
Best sow, two years old or over, S. H. Todd, Wakeman, O	12 00
2d do., S. H. Todd, Wakeman, O	8 00
3d do., Richardson & Reed, Jackson	4 00
Best sow, one year old, S. H. Todd, Wakeman, O	10 00
2d do., S. H. Todd, Wakeman, O	6 00
Best pen of pigs, not less than four in number, nor over ten months old, S. H. Todd, Wakeman, O	10 00
2d do., Richardson & Reed, Jackson	6 00
3d do., Richardson & Reed, Jackson	3 00
Best boar of any age, Richardson & Reed, Jackson	Diploma.

FAT HOGS.

Best barrow or sow, over one year old, J. M. Sharp, Jackson	$10 00
2d do., S. H. Todd, Wakeman, O	6 00
3d do., A. Chandler, Jerome	3 00
Best barrow or sow, less than ten months old, Frank Wilson, Jackson	6 00
2d do., George J. Townley & Son, E. Springport	4 00
3d do., M. L. & F. A. Ray, Concord	2 00

JERSEY RED SWINE.

Alexander Wattles, Battle Creek, special premium	$20 00

GEO. H. D. BOYCE,
H. G. HOLT,
H. W. PURSEL,
Viewing Committee.

DIVISION E.—POULTRY.

CLASS 31—ASIATIC.

Best pair light brahma fowls, Welsh & Terpening, Reading	$2 00
2d do., Welsh & Terpenning, Reading	1 00
Best pair light brahma chicks, Welsh & Terpenning, Reading	2 00
2d do., Welsh & Terpenning, Reading	1 00
Best pair dark brahma chicks, Beecher & Henderson, Marshall	2 00
Best pair buff cochin chicks, Geo. H. White, Marshall	2 00
Best pair partridge cochin fowls, Andrew Burger, Adrian	1 00
Best pair partridge cochin chicks, Ambrose Purchase, Auburn	2 00
2d do., Geo. H. White, Marshall	1 00
Best pair white cochin fowls, Andrew Burger, Adrian	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair white cochin chicks, Andrew Burger, Adrian	2 00
2d do., Andrew Berger, Adrian	1 00
Best pair black cochin fowls, Andrew Burger, Adrian	2 00
2d do., Andrew Berger, Adrian	1 00
Best pair black cochin chicks, Andrew Burger, Adrian	2 00
2d do., Beecher & Henderson, Marshall	1 00

DORKING CLASS.

Best pair dominique fowls, Welsh & Terpenning, Reading	$2 00
2d do., Welsh & Terpenning, Reading	1 00
Best pair dominique chicks, A. Burger, Adrian	2 00
2d do., Welsh & Terpenning, Reading	1 00

AMERICAN CLASS.

Best pair plymouth rock fowls, Ambrose Purchase, Auburn	$2 00
2d do., Welsh & Terpenning, Reading	1 00
Best pair plymouth rock chicks, Welsh & Terpenning, Reading	2 00
2d do., Welsh & Terpenning, Reading	1 00

GAME CLASS.

Best pair black breasted red game fowls, John Sweet, Ann Arbor	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair black breasted red game chicks, John Sweet, Ann Arbor	2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair silver game fowls, John Sweet, Ann Arbor	2 00

SPANISH CLASS.

Best pair black Spanish fowls, Welsh & Terpenning, Reading	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair black Spanish chicks, Andrew Berger, Adrian	2 00
2d do., Welsh & Terpenning, Reading	1 00

LEGHORN CLASS.

Best pair white leghorn fowls, Ambrose Purchase, Auburn	$2 00
Best pair white leghorn chicks, Welsh & Terpenning, Reading	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair brown leghorn fowls, Ambrose Purchase, Auburn	2 00
2d do., R. G. Low, Jackson	1 00
Best pair brown leghorn chicks, Ambrose Purchase, Auburn	2 00
2d do., Ambrose Purchase, Auburn	1 00

POLISH CLASS.

Best pair black Polish fowls, Morey Bros., Reading	$2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair black Polish chicks, Morey Bros., Reading	2 00
2d do., Morey Bros., Reading	1 00
Best pair white Polish fowls, Ambrose Purchase, Auburn	2 00
Best pair white Polish chicks, Andrew Burger, Adrian	2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair silver Polish fowls, Andrew Burger, Adrian	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair silver Polish chicks, Andrew Burger, Adrian	2 00
2d do., Andrew Burger, Adrian	1 00

Best pair golden Polish chicks, Ambrose Purchase, Auburn	$2 00
2d do., Welsh & Terpenning, Reading	1 00

FRENCH CLASS.

Best pair Houdan fowls, Ambrose Purchase, Auburn	$2 00
2d do., D. S. Jones, Jackson	1 00
Best pair Houdan chicks, Ambrose Purchase, Auburn	2 00

HAMBURG CLASS.

Best pair silver spangled Hamburg fowls, John Sweet, Ann Arbor	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair silver spangled Hamburg ducks, Ambrose Purchase, Auburn	2 00
2d do., John Sweet, Ann Arbor	1 00

BANTAM CLASS.

Best pair black breasted red game bantam fowls, Andrew Burger, Adrian	$2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair black breasted red game bantam chicks, John Sweet, Ann Arbor	2 00
Best pair duck wing game bantam chicks, John Sweet, Ann Arbor	2 00
Best pair silver laced seabright bantam fowls, Lew Acker, Charlotte	2 00
2d do., Welsh & Terpenning, Reading	1 00
Best pair silver laced seabright bantam chicks, Lew Acker, Charlotte	2 00
Best pair white bantam fowls, John Sweet, Ann Arbor	2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair white bantam chicks, John Sweet, Ann Arbor	2 00
Best pair gilt laced seabright bantam fowls, Andrew Burger, Adrian	2 00
Best pair gold laced seabright bantam chicks, Andrew Burger, Adrian	2 00
Best pair black African bantam fowls, Welsh & Terpenning, Reading	2 00
Best pair black African chicks, Welsh & Terpenning, Reading	2 00
2d do., Welsh & Terpenning, Reading	1 00

TURKEY CLASS.

Best pair bronze turkeys, Milton Reed, South Jackson	$2 00
Best pair white turkeys, Ambrose Purchase, Auburn	2 00
Best pair buff turkeys, Ambrose Purchase, Auburn	2 00
Best pair grey turkeys, Ambrose Purchase, Auburn	2 00
Best pair slate turkeys, Ambrose Purchase, Auburn	2 00
Best pair slate turkey chicks, Ambrose Purchase, Auburn	2 00

ORNAMENTAL CLASS.

Best pair guinea fowls, Ambrose Purchase, Auburn	$2 00
Best pair pea fowls, Ambrose Purchase, Auburn	2 00
Best pair pea fowl chicks, Ambrose Purchase, Auburn	2 00

GOOSE CLASS.

Best pair Toulouse geese, Ambrose Purchase, Auburn	$2 00
Best pair white Chinese geese, Ambrose Purchase, Auburn	2 00
Best pair young white Chinese geese, Ambrose Purchase, Auburn	2 00

DUCK CLASS.

Best pair Roman ducks, Ambrose Purchase, Auburn	$2 00
Best pair Aylesbury ducks, Ambrose Purchase, Auburn	2 00
Best pair Cayuga docks, Ambrose Purchase, Auburn	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair Pekin docks, Henry Pelham, Napoleon	2 00
2d do., Welsh & Terpenning, Reading	1 00

RABBIT CLASS.

Best lop-eared buck rabbit, Ambrose Purchase, Auburn	$2 00
2d do., Ambrose Purchase, Auburn	1 00
Best lop-eared doe rabbit, Ambrose Purchase, Auburn	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair common rabbits, Ambrose Purchase, Auburn	2 00
2d do., Geo. Hibbard, Jackson	1 00

PIGEON CLASS.

Best collection of pigeons, L. H. Cramton, Marshall	$5 00
2d do., Warren Case, Napoleon	3 00

CAGE BIRD CLASS.

Best collection of singing birds, J. Bedford, Jackson	$5 00
2d do., S. G. Wilburt, Jackson	3 00

MINOR PET CLASS.

Best pair squirrels, Ambrose Purchase, Auburn	$2 00
Best pair English ferrets, J. E. Hoag, Deveraux	2 00
Best pair minks, Wm. Randle, Jackson	2 00

STUFFED BIRDS.

Best collection stuffed birds, E. Mummery, Detroit	$10 00
Best, most varied and most valuable collection of poultry entered and owned by one exhibitor, Ambrose Purchase, Auburn	15 00
2d do., John Sweet, Ann Arbor	10 00

NON-ENUMERATED.

Pair Angora rabbits, L. H. Cramton, Marshall	$2 00
Pair Angora rabbits, L. H. Cramton, Marshall	1 00
Pair Embden geese, Ambrose Purchase, Auburn	2 00
Pair Embden geese, young, Ambrose Purchase, Auburn	2 00
Pair wood ducks, Ambrose Purchase, Auburn	2 00
Pair white call ducks, Ambrose Purchase, Auburn	2 00
Pair buff geese, Ambrose Purchase, Auburn	2 00
Pair black Leghorn fowls, Welsh & Terpenning, Reading	2 00
Pair black Leghorn chicks, Welsh & Terpenning, Reading	2 00
Pair Dominique fowls, Andrew Burger, Andrian	2 00
Pair Andalusian fowls, Andrew Burger, Adrian	2 00
Pair Andalusian chicks, Andrew Burger, Adrian	2 00
Pair white pile bantam fowls, Lew Acker, Charlotte	2 00
Pair black Hamburg chicks, John Sweet, Ann Arbor	2 00
Pair silver game bantam chicks, John Sweet, Ann Arbor	2 00
Pair silver game bantam fowls, John Sweet, Ann Arbor	2 00
Pair gold game bantam fowls, John Sweet, Ann Arbor	2 00
Pair rose comb white Leghorns, D. H. Cramton, Marshall	2 00
Pair rose comb Leghorn chicks, L. H. Cramton, Marshall	1 00
Pair red foxes, H. C. Clark, Ann Arbor	1 00
Pair rose comb brown Leghorns, L. H. Cramton, Marshall	2 00
Pair rose comb brown Leghorns, L. H. Cramton, Marshall	1 00

DAVID JONES,
Viewing Committee.

DIVISION F.—FARM AND GARDEN PRODUCE.

CLASS 32—GRAIN AND SEEDS.

Best bushel winter red wheat, A. B. Travis, Brandon	$6 00
2d do., Horace Tanner, Jackson	4 00
Best bushel winter white wheat, Jacob Dingman, Sault St. Marie	6 00
2d do., Albert Case, Manchester	4 00
Best bushel spring wheat, David Brown, Sault St. Marie	5 00
2d do., M. Howlett, Sault St. Marie	3 00
Best bushel rye, J. F. Stebles, Ann Arbor	5 00
2d do., R. M. Webster, Armada	3 00
Best bushel of four-rowed barley, David Woodman, Paw Paw	5 00
Best bushel oats, Horace Tanner, Jackson	5 00
2d do., F. A. More, Ypsilanti	3 00
Best bushel winter barley, David Woodman, Paw Paw	5 00
2d do., Wm. Howlett, Sault St. Marie	3 00
Best bushel Dent corn in the ear, M. Brath, Jackson	5 00
2d do., Lewis Gallup, Jackson	3 00
Best bushel Flint corn in the ear, Horace Tanner, Jackson	5 00
2d do., H. J. Crego, Jackson	3 00

Best bushel other variety of corn, J. D. Perry, Redford	$5 00
2d do.. W. H. Overholt, Mason	3 00
Best bushel peas, Jacob Dingman, Sault St. Marie	5 00
2d do., Geo. W. Prescott, Grand Rapids	3 00
Best bushel white beans, Horace Tanner, Jackson	5 00
2d do., O. Ellison, Jackson	3 00
Best bushel large clover seed, D. L. Garver, Hart	5 00
2d do., David Woodman, Paw Paw	3 00
Best bushel small clover seed, Horace Tanner, Jackson	5 00
2d do., Geo. W. Prescott, Grand Rapids	3 00
Best bushel timothy seed, Horace Tanner, Jackson	5 00
2d do., Geo. W. Prescott, Grand Rapids	3 00
Best bushel buckwheat, Horace Tanner, Jackson	3 00
2d do., Geo. W. Prescott, Grand Rapids	2 00
Best bushel flax, Horace Tanner, Jackson	3 00
2d do., Geo. W. Prescott, Grand Rapids	2 00
Best bushel red top grass seed, Geo. W. Prescott, Grand Rapids	5 00
Best sample of hops, Horace Tanner, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best display of a collection of several kinds of grasses in stalk and head, David Woodman, Paw Paw	10 00
2d do., Joseph Mantle, Jackson	5 00
Best display and collection of corn in the ear, to consist of at least twelve ears of each variety shown, David Woodman, Paw Paw	10 00
2d do., Geo. W. Prescott, Grand Rapids	5 00
Best display of a collection of the several kinds of grain in heads, with stool and root entire, David Woodman, Paw Paw	10 00
2d do., Jacob Dingman, Sault St. Marie	5 00
Best and greatest assortment of kitchen garden seeds properly classified, Geo. W. Prescott, Grand Rapids	10 00
Best exhibition of a general assortment of seeds for field crops, David Woodman, Paw Paw	10 00
2d do., Charles Grant, Thornbery, Ont	5 00
Best display and collection of the several kinds of grain in heads, arranged and named, Chas. Grant, Thornbery, Ont	10 00
2d do., David Woodman, Paw Paw	5 00

BYRON SUTHERLAND,
W. J. CANFIELD,
D. L. GARVER,
Viewing Committee.

CLASS 33—ROOTS AND VEGETABLES.

Best collection of not less than ten varieties of potatoes, a peck of each variety, H. C. Clark, Ann Arbor	$10 00
2d do., W. H. Overholt, Mason	8 00
3d do., Geo. W. Prescott, Grand Rapids	5 00
Best sample peck of seedling potatoes originated and grown in the State, J. A. Williams, Horton	3 00
2d do., M. S. De Puy, St. Louis	2 00
Best three varieties early potatoes, peck of each kind, H. C. Clark, Ann Arbor	3 00
2d do., H. W. Overholt, Mason	2 00
Best three varieties late potatoes, peck of each kind, W. H. Overholt, Mason	3 00
2d do., H. C. Clark, Ann Arbor	2 00
Best sample peck of any variety early potatoes, H. C. Clark, Ann Arbor	3 00
Best sample peck of any late variety potetoes, Stephen Marx, Detroit	2 00
Best sample peck or more of sweet potatoes, C. M. Hubbell, Ypsilanti	3 00
2d do., Geo. W. Prescott, Grand Rapids	2 00
Best dozen blood beets, C. M. Hubbell, Ypsilanti	2 00
2d do., Jas. Mantle, Jackson	1 00
Best dozen turnip beets, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen sugar beets, Jas. Mantle, Jackson	2 00
2d do., Geo. W. Prescott, Grand Rapids	1 00
Best dozen white or yellow beets, James Mantle, Jackson	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00

Best dozen beets for table use, C. M. Hubbell, Ypsilanti	$2 00
2d do., Stephen Marx, Detroit	1 00
Best collection of four or more kinds of beets, ten of a kind, Jas. Mantle, Jackson	2 00
2d do., H. Smith, Grand Rapids	1 00
Best dozen mangel wurtzel, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen orange carrots, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen white carrots, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen any variety of carrots, Stephen Marx, Detroit	2 00
2d do., Jas. Mantle, Jackson	1 00
Best dozen flat turnips, James Mantle, Jackson	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen sweet turnips, Geo. W. Prescott, Grand Rapids	2 00
2d do., H. Smith, Grand Rapids	1 00
Best dozen any other variety of turnips, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best collection of four or more kinds of turnips, not less than ten of a kind, Stephen Marx, Detroit	2 00
2d do., Geo. W. Prescott, Grand Rapids	1 00
Best dozen or more parsnips, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen or more salsify, C. M. Hubbell, Ypsilanti	2 00
2d do., James Mantle, Jackson	1 00
Best dozen or more winter radishes, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best dozen or more summer radishes, Stephen Marx, Detroit	2 00
2d do., Joseph Mantle, Jackson	1 00
Best collection of three or more kinds of radishes, at least ten of a kind, Stephen Marx, Detroit	3 00
2d do., James Mantle, Jackson	2 00
Greatest variety of culinary vegetables grown by one exhibitor, Stephen Marx, Detroit	5 00
2d do., James Mantle, Jackson	2 00
Best four heads drumhead cabbage, C. M. Hubbell, Ypsilanti	2 00
best four heads cone head cabbage, P. E. Pierce, Jackson	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best four heads Savoy cabbage, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best four heads red cabbage, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best collection of five or more kinds of cabbage, four heads of a kind, Stephen Marx, Detroit	3 00
2d do., James Mantle, Jackson	2 00
Best four heads of cauliflower, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best six heads of lettuce, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best six bunches kale, James Mantle, Jackson	2 00
dozen stems celery bleached, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best dozen stems rhubarb, Stephen Marx, Detroit	2 00
2d do., D. E. Pierce, Jackson	1 00
Best half dozen vegetable eggs, Stephen Marx, Detroit	2 00
2d do., H. Smith, Grand Rapids	1 00
Best dozen peppers, C. M. Hubbell, Ypsilanti	2 00
2d do., H. Smith, Grand Rapids	1 00
Best three varieties of tomatoes, dozen each, H. C. Clark, Ann Arbor	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best peck any variety tomatoes, H. C. Clark, Ann Arbor	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best peck white onions, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best peck red onions, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00

Best peck yellow onions, C. M. Hubbell, Ypsilanti	$2 00
2d do., George W. Prescott, Grand Rapids	1 00
Best collection of onions not less than one-half peck of each kind, C. M. Hubbell, Ypsilanti	3 00
2d do., George W. Prescott, Grand Rapids	2 00
Best five summer squashes, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best five marrow squashes, C. M. Hubbell, Ypsilanti	2 00
2d do., H. Smith, Grand Rapids	1 00
Best five Hubbard squashes, E. J. Bentley, Monroe	2 00
2d do., H. C. Clark, Ann Arbor	1 00
Best single squash, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best collection of four or more kinds of squash, at least three of a kind, Stephen Marx, Detroit	3 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Best two sweet pumpkins, H. C. Clark, Ann Arbor	2 00
2d do., James Mantle, Jackson	1 00
Best three water melons, George W. Prescott, Grand Rapids	2 00
2d do., H. C. Clark, Ann Arbor	1 00
Best three musk melons, James Mantle, Jackson	2 00
2d do., George W. Prescott, Grand Rapids	1 00
Best three nutmeg melons, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best three citrons, Robert Bradford, Jackson	2 00
2d do., Horace Tanner, Jackson	1 00
Best collection of three or more kinds of melons, three or more of each kind, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	1 00
Best five cucumbers, George W. Prescott, Grand Rapids	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best half peck garden peas, George W. Prescott, Grand Rapids	2 00
2d do., A. D. Benham, Olivet	1 00
Best half peck Lima beans, H. C. Clark, Ann Arbor	2 00
2d do., H. Smith, Grand Rapids	1 00
Best half peck wax beans, H. Smith, Grand Rapids	2 00
2d do., James Mantle, Jackson	1 00
Best collection of three or more kinds of garden beans, half peck or more of each kind, H. Smith, Grand Rapids	2 00
2d do., James Mantle, Jackson	1 00
Best dozen ears early sweet corn, H. C. Clark, Ann Arbor	2 00
2d do., H. Smith, Grand Rapids	1 00
Best dozen ears late sweet corn, C. M. Hubbell, Ypsilanti	2 00
2d do., James Mantle, Jackson	1 00
Best dozen ears pop corn, George W. Prescott, Grand Rapids	2 00
2d do., H. C. Clark, Ann Arbor	1 00
Best six heads sunflowers, Lewis Gallup, Jackson	2 00
2d do., Stephen Marx, Detroit	1 00
Best six stems Swiss chard, James Mantle, Jackson	2 00
Best six stems parsley, James Mantle, Jackson	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best six stems any sweet or pot herb, James Mantle, Jackson	2 00
Best collection of four or more kinds of sweet or pot herbs, James Mantle, Jackson	3 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Best six stems kohl rabi, George W. Prescott, Grand Rapids	2 00
2d do., H. C. Clark, Ann Arbor	1 00
Best two field pumpkins, James Walker, Jackson	2 00
2d do., Horace Tanner, Jackson	1 00
Best half peck bush beans, H. Smith, Grand Rapids	2 00
2d do., James Mantle, Jackson	1 00
Best six stems spinach, Stephen Marx, Detroit	2 00
2d do., James Mantle, Jackson	2 00

A. B. GULLEY,
JNO. L. MITCHELL,
HIRAM B. CHAPMAN,
Viewing Committee.

CLASS 34—FLOUR, MEAL, AND FEED.

Best flour, made of white wheat, Elliott & Benham, Jackson	$5 00
Best flour, made of red wheat, A. B. Travis, Brandon	5 00
Best sample boiled meal, Elliott & Benham, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best sample corn meal, C. Pedgham, Union City	2 00
2d do., R. M. Webster, Armada	1 00
Best sample ground feed, R. M. Webster, Armada	2 00
2d do., Elliott & Benham, Jackson	1 00
Best sample of buckwheat flour, R. M. Webster, Armada	2 00
2d do., Elliott & Benham, Jackson	1 00
Best sample rye flour, R. M. Webster, Armada	2 00
2d do., Elliott & Benham, Jackson	1 00
Best sample Graham flour, Elliott & Benham, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best sample oat meal, R. M. Webster, Armada	2 00
2d do., Elliott & Benham, Jackson	1 00
Best and largest display of flour, meal, and feed, R. M. Webster, Armada	5 00
2d do., Elliott & Benham, Jackson	3 00

BYRON SUTHERLAND,
W. J. CANFIELD,
D. L. GARVER,
Viewing Committee.

SPECIAL PREMIUM OFFERED BY MICHIGAN CARBON WORKS.

Special premium offered by the Michigan Carbon Works of Detroit, for the purpose of eliciting trials of the difference in the yields of wheat on our Michigan lands, as compared to the land on which there has been no application of the superphosphate.

Two acres of wheat with 400 pounds of phosphates, and two acres without,

J. D. Perry, Redford, 1st	$75 00
Albert Case, Manchester, 2d	50 00
G. C. Gibbs, Big Beaver, 3d	35 00

The special committee appointed to examine the entries and proofs submitted for special premiums offered by the Michigan Carbon Works, would respectfully report:

That there were 13 entries for these premiums. Of these but four presented any proofs, and of these the proofs in one case were voluntarily withdrawn before your committee were appointed, leaving but three entries and proofs for examination.

From the fact that no evidence was submitted or referred as to nature of soil, previous condition of the land, cost of phosphates used, as compared with other fertilizers; and from the further fact that time of seeding, quantity of seed used, and method of sowing varied in each case, the result obtained is not as valuable for practical purposes as it would be under different conditions. Still, it will probably meet the end sought by the parties offering the premiums. To be of practical value to farmers, experiments should be continued on the same lands for at least three years, with proper rotation of crops, using on adjoining pieces of land for trial phosphates or any ordinary fertilizers as the other, with cost of each and comparison of results.

Your committee named awards as follows (all products determined by weight, 60 pounds to the bushel):

1st premium, $75, to J. D. Perry, entry No. 3, Redford, Wayne county, Michigan; sown with drill Sept. 10; 1½ bushels seed per acre.

	Bushels per acre.
Product with phosphate fertilizer	25 41-60
Product without phosphate fertilizer	13 44-60
Gain by use of fertilizer	12 37-60

2d premium, $50, to Albert Case, entry No. 5, Manchester, Washtenaw county, Michigan; sown broadcast Sept. 26; 1¾ bushels seed to acre.

	Bushels per acre.
Product with phosphate fertilizer	18 30-60
Product without phosphate fertilizer	9 20-60
Gain by use of fertilizer	9 10-60

3d premium, $35, to G. C. Gibb, entry No. 7, Troy, Oakland county, Michigan, Big Beaver postoffice; sown with drill Sept. 20; 2 bushels seed per acre.

	Bushels per acre.
Product with phosphate fertilizer	16 31-60
Product without phosphate fertilizer	10 17-60
Gain by use of fertilizer	6 14-60

W. J. BAXTER,
WM. CHAMBERLAIN,
C. A. HARRISON,
Committee.

Jackson, Sept. 22, 1881.

DIVISION G—DAIRY AND OTHER PRODUCTS.

CLASS 35—BUTTER, CHEESE, AND OTHER DAIRY ARTICLES.

Best twenty-five pounds of domestic butter, Geo. W. Prescott, Grand Rapids	$16 00
2d do., J. Smalk, Paw Paw	12 00
3d do., Harrison Haynes, Grass Lake	8 00
Best ten pounds of domestic butter, J. H. Townley, Tompkins	8 00
2d do., Mrs. M. W. Clark, Parma	6 00
3d do., Mrs. J. H. Corwin, Grass Lake	4 00
Best exhibit of cheese, not less than five in number, from any household or private dairy, Joseph Yocum, Wellington, O	10 00
2d do., F. L. Roser & Co., Wellington, O	8 00
Best display of cheese by any factory, Geo. B. Horton, Adrian	25 00
2d do., F. L. Roser & Co., Wellington, O	20 00
3d do., Jas. E. Cunningham, Reading	15 00
Best churn for making butter, Mosely & Stoddard Mf'g Co., Poultney, Vt.	1 00
Best creamer, Mosely & Stoddard Mf'g Co., Poultney, Vt	3 00

NON-ENUMERATED.

Churn power, J. B. Alexander, Jackson	$2 00
Ash butter tub, S. F. Heywood, Jackson	1 00
Spruce butter tub, S. F. Heywood, Jackson	1 00

DENNIS WOLVERTON,
EDWIN PHELPS,
Viewing Committee.

CLASS 36—SUGAR, BREAD, AND PICKLES.

Best golden maple syrup, D. L. Garver, Hart	$3 00
2d do., J. W. Heline, Adrian	2 00
Best ten pounds maple sugar, Warren Worden, Yorkshire Center	5 00
2d do., D. L. Garver, Hart	3 00
Best three loaves milk or salt rising bread, Mrs. M. W. Clark, Parma	3 00
2d do., Mrs. Martin V. True, Jackson	2 00
Best three loaves yeast bread, Mrs. W. M. Clark, Parma	3 00
2d do., M. E. Bartlett, Tompkins	1 00
Best soda rising bread, Mrs. Martin V. True, Jackson	3 00
2d do., Mrs. J. F. Drew, Jackson	1 00
Best corn bread, M. E. Bartlett, Tompkins	3 00
2d do., Miss Minnie De Puy, Jackson	2 00
Best three loaves brown bread, or rye and Indian, R. M. Webster, Armada.	3 00
Best sample flour bread made by a girl sixteen years old or under, Miss Grace Merritt, Jackson	2 00
Best sample of brown bread made by a girl sixteen years old or under, M. E. Bartlett, Tompkins	3 00
2d do., F. M. Reasner, Jackson	2 00
Best display of specimens of pickled vegetables, R. M. Webster, Armada	5 00
2d do., Geo. W. Prescott, Grand Rapids	3 00

D. WOLVERTON,
M. SCHRAM,
Viewing Committee.

CLASS 37—HONEY, BEES, AND BEE FIXTURES.

Best colony of bees in movable comb bee hive, H. Townley, Tompkins	$5 00
2d do., H. D. Cutting, Clinton	3 00
Best bee hive, method of manipulation and manner of securing surplus honey to be considered, H. D. Cutting, Clinton	5 00
2d do., H. D. Cutting, Clinton	3 00
Best specimen of comb honey, not less than ten pounds, manner of putting up to be considered, H. D. Cutting, Clinton	5 00
2d do., Mrs. D. H. Ranney, Jackson	3 00
Best specimen of extracted honey, not less than ten pounds, manner of putting up to be taken into consideration, H. D. Cutting, Clinton	5 00
2d do., A. D. Benham, Olivet	3 00
Best ten pounds of beeswax, H. D. Cutting, Clinton	2 00
2d do., A. D. Benham, Olivet	1 00
Best specimen of artificial comb foundation, A. D. Benham, Olivet	3 00
2d do., J. H. Townley, Tompkins	1 00
Largest and best collection of apiariam implements, to include hives, honey extractors, wax extractors, comb foundation, machines, honey knives, shipping cages, etc., H. D. Cutting, Clinton	10 00
Best honey extractor, H. D. Cutting, Clinton	3 00
2d do., A. D. Benham, Olivet	2 00
Best bee smoker, H. D. Cutting, Clinton	2 00
2d do., H. D. Cutting, Clinton	1 00
Best honey knife for uncapping, H. D. Cutting, Clinton	1 00
Best comb foundation machine, H. D. Cutting, Clinton	3 00
2d do., A. D. Benham, Olivet	2 00
Best wax extractor, A. D. Benham, Olivet	2 00
Best collection of queen bees alive, H. D. Cutting, Clinton	3 00
Largest and best collection of bee literature, H. D. Cutting, Clinton	5 00

NON-ENUMERATED.

Bee feeder, H. D. Cutting, Clinton, first premium	$1 00

EDWIN PHELPS,
D. WOLVERTON,
Viewing Committee.

CLASS 38—PREPARED GROCERIES, ETC.

Preserved cider, Frank Ford, Ravanna, Ohio	$2 00
Cider preservative, Frank Ford, Ravanna, Ohio	2 00

DIVISION H.—HOUSEHOLD ARTICLES.

CLASS 45.

Carpet sweeper, W. S. Snell, Detroit	$1 00
Washing machine, G. F. Burch, Jackson	2 00
Clothes wringing machine, C. W. Riggs, Francisco	1 00
Laundry table, Wm. Dicer, Marshall	1 00
Collar and cuff ironing machine, A. M. Shearer, Jackson	2 00
Shirt polisher, A. M. Shearer, Jackson	1 00

MILTON J. GARD,
B. B. MOSLER,
G. HOWARD,
Viewing Committee.

DIVISION I—VEHICLES.

CLASS 46.—WAGONS AND CARRIAGES.

Best two-horse family carriage, A. Clark & Co., Lansing	$10 00
2d do., Romeo Carriage Co., Romeo	5 00
Best one-horse carriage, Romeo Carriage Co., Romeo	6 00
2d do., A. Clark & Co., Lansing	3 00
Best two-spring phaeton, M. J. Cooney & Co., Toledo, Ohio	6 00
2d do., Romeo Carriage Co	3 00
Best three-spring phaeton, Romeo Carriage Co., Romeo	6 00
2d do., J. J. Deal, Jonesville	3 00

Best top buggy, M. J. Cooney & Co., Toledo, Ohio	$6 00
2d do., Romeo Carriage Co., Romeo	3 00
Best buggy without top, J. J. Deal, Jonesville	6 00
2d do., Romeo Carriage Co., Romeo	3 00
Best trotting wagon, A. Clark & Co., Lansing	6 00
2d do., J. W. Hewett, Jackson	3 00
Best trotting sulky, A. Bedford, Coldwater	6 00
2d do., J. W. Hewett, Jackson	3 00
Best farm wagon for all purposes, Austin, Tomlinson & Webster Manufacturing Co., Jackson	10 00
2d do., Rough Bros., Buchanan	5 00
Best spring wagon for market, Michigan Manufacturing Co., Jackson	10 00
2d do., Griffin & Rogers, Mason	5 00
Best single sleigh or cutter, Kalamazoo Wagon Co., Kalamazoo	5 00
2d do., A. Clark & Co., Lansing	3 00
Best single farm wagon, Austin, Tomlinson & Webster Manufacturing Co., Jackson	5 00
Best pair bob sleighs for lumbering, Gale Manufacturing Co., Albion	3 00
Best trucks for lumbering purposes, Austin, Tomlinson & Webster Manufacturing Co., Jackson	3 00
Best carriage jack, J. M. & S. M. Baird, Holly	1 00
Best display of vehicles, Romeo Carriage Co., Romeo	20 00
2d do., A. Clark & Co., Lansing	10 00

H. M. CURTIS,
Viewing Committee.

DIVISION J.—MACHINERY.

CLASS 47.

Machine for making tile, Brewer & Co., Tecumseh	Medal.
Shaft coupling, E. Dennis, Jackson	$2 00
Display of iron castings, E. Dennis, Jackson	2 00
Best machine for making brick, J. W. Penfield, Willoughby, Ohio	Medal.
Fan blower, E. Dennis, Jackson	$3 00
Circular saw, E. Dennis, Jackson	3 00
Cross-cut saw, E. Dennis, Jackson	1 00
Steam engine, Atlas Engine Works, Indianapolis, Ind.,	Medal.

NON-ENUMERATED.

Adjustable pulley, J. B. Stockham, Jackson	$2 00
Grain binder model, Laraway & Dingman, Battle Creek	2 00
Steam cooker model, Dr. Pratt, Jackson	1 00
Hoop coiler, A. F. Ward, Detroit	Medal.
Counter shaft, E. Dennis, Jackson	$1 00
Drill press, E. Dennis, Jackson	3 00
Leather belting, E. Dennis, Jackson	1 00
Domestic steam cooker, Frost & Rawson, Jackson	2 00
Combined steam gauge, glass water gauge, try cock, and low water detector, Jackson Foundry, Jackson	1 00

N. BROWN,
T. DENSMORE,
Viewing Committee.

CLASS 48.—MACHINERY.

Check valve, Morton Valve Co., Romeo	$1 00
Ready adjusting self-oiling saw guide, Rodebaugh, Hobert & Co., Jackson	Medal.
Mill dog with interlocking knives, Rodebaugh, Hobert & Co., Jackson	$3 00

J. A. GROSVENOR,
J. C. ESTOW,
C. F. AUSTIN,
Viewing Committee.

DIVISION K.—MANUFACTURED GOODS.

CLASS 49.—MATERIALS.

Best display of wool from any county in Michigan, to consist of not less than ten samples from not less than ten different flocks, R. M. Cross, Ovid	$25 00
Best display of fine wool, not less than ten samples by one exhibitor, R. M. Cross, Ovid	7 00
2d do., Jas. M. Moore, Brooklyn	5 00
3d do., Van Gieson Bros., Clinton	3 00
Best display of long wool, not less than ten samples by one exhibitor, Amos F. Wood, Moson	7 00
2d do., R. M. Cross, Ovid	5 00
Best display of middle wools, not less than ten samples by one exhibitor, Thos. A. Moore, Ypsilanti	7 00
2d do., D. B. Kelly, Ypsilanti	5 00
3d do., Moore & Kelly, Ypsilanti	3 00
Best display of flax from any county in Michigan, Miss Sarah Barber, Fairfield	5 00
2d do., Mrs. A. McClary, Galesburg	3 00
Best display of prepared flax raised by exhibitor, Miss Sarah Barber, Fairfield	5 00

HARVEY HAYNES,
A. B. WEST,
G. W. ARCHER,
Viewing Committee.

CLASS 52.—ARTICLES OF LEATHER AND INDIA RUBBER.

Ladies' winter boots, D. B. Freeman, Jackson	$1 00
Ladies' summer boots, D. B. Freeman, Jackson	1 00
Ladies' shoes, D. B. Freeman, Jackson	1 00
Children's shoes, D. B. Freeman, Jackson	1 00
Display of boots and shoes of all kinds, manufactured in Michigan, D. B. Freeman, Jackson	10 00
Single harnes, J. W. Orr, Jackson	3 00
Riding bridle and martingale, Fred. White, Jackson	2 00

NON-ENUMERATED.

Strap track harness, J. W. Orr, Jackson	$1 00

J. A. GROSVENOR,
G. F. RANDEL,
Viewing Committee.

CLASS 53—ARTICLES OF FURNITURE.

Best sofa, Meilink, Small & Co., Toledo, O.	$3 00
2d do., Meilink, Small & Co., Toledo, O.	3 00
Easy chair, Meilink, Small & Co., Toledo, O.	3 00
Uhpolstered reception chair, Meilink, Small & Co., Toledo, O.	3 00
Center table, Meilink, Small & Co., Toledo, O.	3 00
Set chamber furniture, Meilink, Small & Co., Toledo, O.	10 00
Set dining room chairs, Meilink, Small & Co., Toledo, O.	3 00
Extension table, Meilink, Small & Co., Toledo, O.	3 00
Display of furniture of all kinds, Meilink, Small & Co., Toledo, O.	15 00
Display of veneers, J. Becker & Son, Detroit	5 00

O. K. OLMSTED,
WALTER MARTH,
Viewing Committee.

CLASS 54—IRON WORK AND ORNAMENTAL CONCRETE WORK.

Ornamental bracket work, G. W. Hooper, Jackson	$3 00
Ornamental vase, T. L. Amphlett & Son, Ionia	2 00
Cast iron fence, E. T. Barnum, Detroit	3 00
Display of iron work, E. T. Barnum, Detroit	3 00

A. F. CHANDLER,
A. A. WOOD,
Viewing Committee.

DIVISION L.

CLASS 56—CLOCKS, JEWELRY, AND PLATED WARE.

Best exhibition of silver plated ware, J. B. Timberlake, Jackson, diploma and	$5 00
Best exhibition of Britannia ware, J. B. Timberlake, Jackson	2 00

FRANKLIN MILLS,
JAS. H. JONES,
Viewing Committee.

DIVISION M.—PRINTING, PAINTING, AND STATIONERY.

CLASS 57—PAINTING AND SCULPTURE.

Best landscape painting in oil of scenery in Michigan, A. J. Brow, Detroit	$10 00
2d do., A. J. Brow, Detroit	5 00
Best historical painting in oil by exhibitor, Miss Augusta Bruce, Clinton	5 00
Composition landscape in oil by exhibitor, Mrs. H. W. Mosher, Albion	5 00
Landscape from nature in oil by exhibitor, Mrs. G. D. Wolcott, Jackson	5 00
Marine scene in oil by exhibitor, Mrs. W. K. Gibson, Jackson	5 00
2d do., Mrs. E. C. Brown, Jackson	3 00
Best animal piece from life in oil by exhibitor, Carl Johnson, Jackson	5 00
2d do., Carl Johnson, Jackson	3 00
Best bird piece in oil by exhibitor, Miss Ada Upton, Big Rapids	5 00
2d do., Mrs. E. C. Brown, Jackson	3 00
Best fruit piece in oil by exhibitor, Mrs. W. K. Gibson, Jackson	5 00
2d do., Miss Minnie DePuy, Jackson	3 00
Best flower piece in oil by exhibitor, Miss Ada Uupton, Big Rapids	5 00
2d do., Mrs. W. K. Gibson, Jackson	3 00
Best portrait from life, large size, by exhibitor, A. O. Rivenaugh, Jackson	10 00
fancy painting in oil by exhibitor, Miss L. S. Cooley, Jackson	3 00
2d do., Mrs. W. K. Gibson, Jackson	2 00
Best landscape painting in water colors of scenery in Michigan, H. A. Mills, Albion	5 00
2d do., Miss Mattie Walcott, Jackson	3 00
Best portrait painting in water colors by exhibitor, H. A. Mills, Albion	5 00
historical painting in oil by exhibitor, A. J. Brow, Detroit	10 00
landscape painting in oil by any person, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best marine painting in oil by any person, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best portrait in oil by any person, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best special subject in oil by any person, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best special subject in water colors by any person, A. J. Brow, Detroit	3 00
2d do., A. J. Brow, Detroit	2 00
Best collection of oil paintings not less than five by a person not a dealer, Mrs. W. K. Gibson, Jackson	5 00
2d do., Miss L. S. Cooley, Jackson	3 00
Best collection of oil paintings by any dealer or association, 25 or more, A. J. Brow, Detroit	25 00
2d do., E. L. Lovejoy, Jackson	10 00
Best winter piece in oil by exhibitor, Mrs. W. K. Gibson, Jackson	5 00
2d do., Miss Mattie Walcott, Jackson	3 00
Best pastel painting of face, Bigelow & Weed, Jackson	3 00
2d do., E. L. Lovejoy, Jackson	2 00
Best pastel painting of landscape, Miss Kate Morrel, Jackson	3 00
2d do., Miss Kate Morrel, Jackson	2 00
Best crayon drawing of face, Mrs. F. Livermore, Jackson	2 00
crayon drawing of animal, Fred A. Smith, Jackson	2 00
crayon drawing of landscape, Mrs. D. G. Walcott, Jackson	2 00
collection of photographs by any person, H. A. Steele, Jackson	3 00
2d do., Bigelow & Weed, Jackson	2 00
Best portrait photograph, life size, H. A. Steele, Jackson	2 00
2d do., Bigcolow & Weed, Jackson	1 00
Best landscape photograph, Bigelow & Weed, Jackson	2 00

Best animal photograph, E. L. Lovejoy, Jackson	$2 00
2d do., Bigelow & Weed, Jackson	1 00
Best portrait photograph colored, H. A. Steele, Jackson	2 00
2d do., Bigelow & Weed, Jackson	1 00
Best three cabinet photographs, H. A. Steele, Jackson	2 00
2d do., Bigelow & Weed, Jackson	1 00
Best half dozen miniature photographs, Bigelow & Weed, Jackson	2 00
Best half-dozen miniature porcelain photographs, Bigelow & Weed, Jackson	2 00
Best India ink drawing, H. A. Steele, Jackson	3 00
2d do., E. L. Lovejoy, Jackson	2 00
Best display of gilt frames, A. J. Brow, Detroit	5 00
2d do., E, L. Lovejoy, Jackson	2 00
Best display of picture frames, A. J. Brow, Detroit	5 00
2d do., E. L. Lovejoy, Jackson	2 00
Best display of decorated porcelain, not less than twenty-five pieces, Mrs. O. F. Woodcock, Lansing	10 00
Best collection of paintings on slate, not less than five in number, Mrs. G. D. Wolcott, Jackson	5 00
Best specimen of painting on plaque, Miss Ada Upton, Big Rapids	3 00
2d do., Mrs. W. K. Gibson, Jackson	2 00
Best specimen of painting on slate, Mrs. W. K. Gibson, Jackson	3 00
2d do., Mrs. G. D. Walcott, Jackson	1 00
Best specimen of painting on silk, Mrs. G. D. Walcott, Jackson	3 00
Best specimen of painting on holly, E. L. Lovejoy, Jackson	2 00
2d do., Mrs. G. D. Walcott, Jackson	1 00
Best specimen of painting on shell, E. L. Lovejoy, Jackson	3 00
2d do., Mes. G. D. Walcott, Jackson	2 00
Best specimen of painting on ebonized panel, E. L. Lovejoy, Jackson	3 00
2d do., Mrs. W. K. Gibson, Jackson	2 00

NON-ENUMERATED.

Crayon drawing of figure, M. M. Mudge, Belding	3 00
Spatter work picture, M. Vaughn, Jackson	2 00
Specimen painting on velvet, Mrs. D. C. Blair, Jackson	3 00
Display portrait photographs, Mrs. L. Sherwood, Ypsilanti	2 00
Specimen of painting on glass, Michael Murray, Jackson	1 00
Picture and book display, Rev. Thos. Burpe, Jackson	3 00
Two penmanship pieces, Msss Kate Lennon, Jackson	3 00

PHILO PARSONS,
P. HAYDEN,
H. C. LEWIS,
Viewing Committee.

CLASS 58—PRINTING AND STATIONERY.

Best paper made from straw, rags, and other material, and paper for newspaper work, W. A. Hammond & Co., Jackson	Medal.

PHILO PARSONS,
P. HAYDEN,
H. C. LEWIS,
Viewing Committee.

DIVISION N.—ORNAMENTAL NEEDLE WORK.

CLASS 60.—PLAIN NEEDLE AND MACHINE WORK.

Best specimen of plain needle work, Miss Hattie Emmons, Byron Center	$3 00
2d do., M. E. Bartlett, Tompkins Center	2 00
Best fine shirt all by hand, Mrs. M. W. Clark, Parma	2 00
2d do., Mrs. W. H. Overholt, Mason	1 00
Best pair of plain handkerchiefs, Miss Hattie Emmons, Byron Center	1 00
Best silk patchwork quilt by hand, Mrs. A. J. Brow, Detroit	5 00
2d do., Miss Etta R. Baker, Jackson	2 00
Best calico patchwork quilt by hand, Mrs. Jas. De Puy, Jackson	2 00
2d do., Mrs. A. McClary, Galesburg	1 00
Best worsted patchwork quilt by hand, Miss Maggie Keeler, Parma	2 00
2d do., O. Tompkins, Liberty	1 00

Best plain white muslin quilt by hand, Mrs. A. McClary, Galesburg	$2 00
Best pair plain sheets by hand, Miss Hattie Emmons, Byron Center	1 00
2d do., R. M. Webster, Armada	50
Best pair plain pillow cases by hand, Mrs. M. M. Wells, Jackson	1 00
2d do., Miss Hattie Emmons, Byron Center	50
Best sample of braiding by hand, Mrs. A. J. Brow, Detroit	2 00
2d do., Mrs. W. H. Overholt, Mason	1 00
Best specimen of hem stitching, Mrs. Dwight Merriman, Jackson	2 00
2d do., Mrs. M. M. Wells, Jackson	1 00
Best plain sewing by machine, Mrs. W. K. Gibson, Jackson	2 00
Best fine shirt by machine, Miss Hattie Wright, Jackson	2 00

NON-ENUMERATED.

Pair pillow and shirt shams, Mrs. M. W. Clark, Parma	50
Fine shirt, machine made, Mrs. M. W. Clark, Parma	50
Pair darned net pillow shams, Hattie Hunt, Jackson	1 00
Table cover, Miss Louis Mann, Jackson	1 00
Three pairs pillow shams, Mrs. Louis Mann, Jackson	1 00
Double coverlet, Mrs. Olive Driscoll, Jackson	1 00

MRS. E. C. BROWN,
MRS. CHAS. B. WESTON,
Viewing Committee.

CLASS 61—EMBROIDERY AND ORNAMENTAL NEEDLE WORK.

Best and largest collection of ornamental needle work or embroidery by one person, Mrs. M. M. Wells, Jackson	$8 00
2d do., Miss Etta R. Baker, Jackson	5 00
Best embroidered infant's dress, Mrs. C. H. Mitchamere, Jackson	2 00
2d do., Mrs. C. H. Mitchamere, Jackson	1 00
Best embroidered pillow covers in cotton or linen, G. M. Stanley, Jackson	3 00
2d do., Mrs. D. C. Meserole, Jackson	2 00
Best embroidered infant's blanket, Mrs. F. R. Draper, Jackson	2 00
2d do., Mrs. Van Dering, Sandstone	1 00
Best embroidered handkerchief in cotton or linen, Mrs. L. Sherwood, Ypsilanti	2 00
2d do., Mrs. A. J. Brow, Detroit	1 00
Best embroidered letters in marking cotton or linen, Mrs. A. J. Brow, Detroit	1 00
Best embroidered infant's dress in silk, Miss Etta R. Baker, Jackson	2 00
2d do., Mrs. F. R. Draper, Jackson	1 00
Best embroidered ottoman or chair cover in silk, Mrs. D. S. Holcomb, Jackson	2 00
Best embroidered piano or table cover, Mrs. W. K. Gibson	4 00
2d do., Mrs. M. W. Clark, Parma	3 00
Best embroidered ladies' dress or mantle in silk, Mrs. M. M. Wells, Jackson	3 00
Best specimen chenille embroidery, Miss Stella Reed, Jackson	2 00
2d do., Mrs. Walter Webb, Jackson	1 00
Best cut or tufted work, Mrs. J. H. Townley, Tompkins	3 00
2d do., Mrs. A. McQuillin, Rives Junction	1 00
Best pair lamp mats in worsted, Mrs. D. C. Blair, Napoleon	1 00
2d do., Miss Nellie C. Jenkins, Jackson	50
Embroidered ottoman or chair cover in worsted, Mrs. D. F. Woodcock, Lansing	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00
Best pair of slippers in silk, Miss Nellie Merriman, Jackson	1 00
Best sample towel rack, Mrs. D. F. Woodcock, Lansing	1 00
2d do., Mrs. M. M. Wells, Jackson	50
Best embroidered foot rest, Mrs. Martin V. True, Jackson	2 00
Best specimen Honiton lace work, Mrs. J. F. Watts, Leslie	2 00
2d do., Mrs. Walter Webb, Jackson	1 00
Largest and best collection of lace work, Mrs. M. M. Wells, Jackson	4 00
2d do., Mrs. J. F. Watts, Leslie	2 00
Best applique embroidery in silk or velvet, Mrs. D. F. Woodcock, Lansing	2 00
Best cretonne embroidery, Mrs. E. C. Brown, Jackson	2 00
Best graphic embroidery, Mrs. E. C. Brown, Jackson	2 00

Best crewel embroidery, Miss Carrie Choate, Jackson	$2 00
2d do., Mrs. D. F. Woodcock, Lansing	1 00
Best embroidered bracket, Mrs. Walter Webb, Jackson	1 00
2d do., Miss Nellie Merriman, Jackson	50
Best embroidered toilet set, including mat cushion and cover, Miss Louisa Mann, Jackson	3 00
2d do., Mrs. P. E. Pierce, Jackson	2 00
Best embroidered sofa pillow in worsted, Mrs. F. Livermore, Jackson	3 00
2d do., Mrs. D. F. Woodcock, Lansing	2 00
Best fancy pin cushion, Mrs. M. W. Clark, Parma	1 00
2d do., Mrs. M. M. Wells, Jackson	50
Best toilet set in worsted or lace, Mrs. A. J. Brow, Detroit	1 00
Best macrami work, Miss Nellie C. Jenkins, Jackson	2 00
2d do., Mrs. Chas. B. Westren, Henrietta	1 00
Best embroidered tidy in silk, Mrs. D. C. Blair, Napoleon	2 00
2d do., Mrs. M. W. Clark, Parma	1 00

NON-ENUMERATED.

Embroidered hose, Miss Etta R. Baker, Jackson	$1 00
Specimen of darning, Miss Nellie M. Merriman, Jackson	1 00
Scrap bay, Miss Carrie Schwarz, Adrian	50
Display of point lace, Mrs. F. Livermore, Jackson	3 00
Plain sofa pillow, Mrs. Louis Mann, Jackson	50
Ladies' embroidered skirt, Mrs. Louis Mann, Jackson	2 00
Cotton skirt embroidered, Mrs. M. M. Wells, Jackson	1 00
Embroidered lace tidy, Mrs. Chas. B. Westren, Henrietta	50
Satin and felt embroidered in chenille, Miss Stella A. Reed, Jackson	1 00
Cotton embroieery hand work, Mrs. R. C. Warren, Jackson	2 00
Pair pillow shams in lace, Mrs. H. Bayliss, Wayne	3 00
Handkerchief in lace, Mrs. H. Bayliss, Wayne	2 00
Specimen of embroidery in silk, Mrs. D. C. Meserole, Jackson	1 00
Crewel work, designed and worked by a lady eighty-two years old, Mrs. W. K. Gibson, Jackson	2 00
Stocking supporter, Mrs. S. H. Helwig, Jackson	1 00
Ladies' camp thread-holder, Mrs. S. H. Helwig, Jackson	50
Two specimens bead work, Mrs. J. F. Watts, Leslie	2 00
Collection of black point lace, Mrs. M. M. Wells, Jackson	1 00
Embroidered chair, Mrs. Nellie Wallace, Jackson	3 00
Pair worsted pillow shams, Mrs. A. Crittenden, Jackson	50
Carpet covelet, Mrs. A. Crittenden, Jackson	2 00

MRS. W. H. BROCKWAY,
MISS VAN ANTWERP,
MISS L. DART,
Viewing Committee.

CLASS 62—CROCHET, KNIT AND FANCY WORK.

Best gent's scarf, Mrs. Dwight Merriman, Jackson	$1 00
Best Afghan robe, Mrs. H. C. Clark, Ann Arbor	5 00
2d do., Mrs. Walter Webb, Jackson	3 00
Best child's Afghan robe, Mrs. M. W. Clark, Parma	2 00
Best cotton tidy, Mrs. A. J. Brow, Detroit	2 00
2d do., M. E. Bartlett, Tompkins Center	1 00
Best worsted tidy, Mrs. M. W. Clark, Parma	1 00
2d do., Miss Nellie W. Merriman, Jackson	50
Best pair crochet toilet mats, Mrs. A. J. Brow, Detroit	2 00
Best crochet or knit hood, Mrs. Chas. B. Westren, Henrietta	2 00
2d do., Mrs. D. S. Holcomb, Jackson	1 00
Best crochet or knit bed spread, Mrs. R. McNaughton, Jackson	3 00
2d do., Mrs. G. O. Ladd, Norvell	1 00
Best crochet or knit shawl, Miss Nellie W. Merriman, Jackson	3 00
2d do., Mrs. A. J. Brow, Detroit	1 00
Best crochet or knit ladies sack, Mrs. A. J. Brow, Detroit	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00
Best crochet or knit infant boots, Miss Carrie Choat, Jackson	1 00
Best crochet or knit fancy mittens, Miss Mary Austin, Jackson	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00
Best crochet or knit fancy purse, Mrs. Dwight Merriman, Jackson	1 00

NON-ENUMERATED.

Knit bed spread, Mrs. A. D. Eddy, Jackson	$2 00
Lambrequin in worsted, Mrs. M. W. Clark, Parma	1 00
Crochet hassock, Miss Nellie W. Merriman, Jackson	50
Table spread and bracket, Miss Nellie W. Merriman, Jackson	50
Pair knit fancy infant's socks, Miss Carrie Choat, Jackson	50
Pair crochet gent's gloves, Mrs. M. W. Clark, Parma	25
Pair crochet gent's gloves, Mrs. M. W. Clark, Parma	25

MRS. HENRY H. SMITH,
MRS. G. H. HARTWELL,
Viewing Committee.

CLASS 63—HAIR, SHELL, AND WAX WORK.

Best display of hair work, Miss E. L. Horton, Jackson	$3 00
2d do., Mrs. F. Rentchler, Ann Arbor	2 00
Best display of wax work, R. M. Webster, Armada	3 00
Best specimen feather fan, Mrs. Dwight Merriman, Jackson	1 00
Best display of wax flowers, Mrs. John Moody, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best display of fruit in wax, R. M. Webster, Armada	3 00
Best display artificial flowers in silk, muslin, paper or feathers, Mrs. C. B. Westren, Henrietta	2 00
2d do., feather bouquet, M. E. Bartlett, Tompkins Center	1 00
Best wreath of dried grasses and plants, Nellie C. Jenkins, Jackson	2 00
2d do., Mrs. P. E. Pierce, Jackson	1 00
Best bouquet of dried grasses and flowers, Mrs. W. K. Gibson, Jackson	2 00

NON-ENUMERATED.

Feather wreath, A. S. Fish, Parma	$2 00
Case of eggs, Mrs. F. M. Reasner, Jackson	1 00
Wax motto, R. M. Webster, Armada	1 00
Display of hair jewelry, Mrs. F. Rentchler, Ann Arbor	1 00
Artificial flowers in basket, Mrs. F. Rentchler, Ann Arbor	1 00

MRS. HENRY H. SMITH,
MRS. S. H. HARTWELL,
Viewing Committee.

DIVISION O.—MISCELLANEOUS.

CLASS 64—MISCELLANEOUS ARTICLES.

Best specimen of brick, J. W. Penfield, Willoughby, O.	$3 00
Best collection of fire brick, Jackson Fire Clay Co., Jackson	3 00
Best collection of work in marble, L. D. Vinson & Co., Jackson	5 00

NON-ENUMERATED.

Tabular fountain fence, J. W. Fuller, Jackson	2 00
Vitrified salt-glazed sewer pipe, drain tile and paving brick, Jackson Fire Clay Co., Jackson	15 00
Display of sewer tile and sewer pipe, Bennet Brick & Tile Co., Jackson	10 00
Exhibition of hearse, caskets, and burial robes, Olmstead, Carey & Delehanty, Jackson	20 00
Specimen artificial stone, P. Jenkins, Jackson	2 00
Barrel ground bone, C. R. Taylor, Jackson	5 00
Specimen of wood-turned ware, O. W. Bliss, Ionia	2 00
Wrought iron fence, E. T. Barnum, Detroit	5 00

N. BROWN,
T. DENSMORE,
Viewing Committee.

DIVISION P.—CHILDREN'S DEPARTMENT.

Specimen of hand sewing, Maggie Trust, age 11, Jackson	$2 00
Specimen drawing, Maggie Trust, Jackson	1 00
Set toy furniture, Maggie Trust, Jackson	50

Pair plain handkerchiefs, M. E. Bartlett, Tompkins Center	$0 50
Pair pillow cases, by hand, M. E. Bartlett, Tompkins Center	50
Plain calico dress, by hand, M. E. Bartlett, Tompkins Center	1 00
Silk quilt, Sadie Brown, Jackson	1 00
Patchwork quilt, Willis Conner, 6 years old, Jackson	50
Bedroom set, Arthur V. Potter, aged 12 years, Jackson	2 00
Panel picture, Cora Bush, Grass Lake	1 00
Landscape picture, Cora Bush, Grass Lake	50
Wool patchwork quilt, Carrie Rose, Jackson	50
Patchwork quilt, Irene Allison, age 8 years, Jackson	25
Patchwork quilt, Irene Allison, age 8 years, Jackson	25
Patchwork quilt, Victor Wilcox, Jackson	25
Specimen scroll sawing, H. F. Watts, Leslie	1 00
Worsted tidy, Edith Holcomb, Jackson	50
Toilet set, Edith Holcomb, Jackson	50
Sampled canned fruit, Ada C. Prescott, Grand Rapids	50
Collection of canned fruits, Ada C. Prescott, Grand Rapids	50
Loaf of brown bread, Sadie Brown, Jackson	25

MISS MINNIE H. BROW,
MRS. MARY W. MERRIMAN,
Viewing Committee.

The foregoing list does not include the awards of the Pomological Department; this department was under the auspices of the State Horticultural Society, and premium checks drawn by their secretary to the amount of $660.50, were paid by this society.

MICHIGAN STATE AGRICULTURAL SOCIETY.

PROCEEDINGS AND REPORTS FOR THE YEAR 1882.

OFFICERS FOR 1882.

PRESIDENT—HENRY FRALICK, Grand Rapids.
TREASURER—A. J. DEAN, Adrian.
SECRETARY—J. C. STERLING, Monroe.

EXECUTIVE COMMITTEE.

Terms expire January, 1884.

ABEL ANGEL, Bradley, Allegan Co.
D. W. HOWARD, Pentwater, Oceana Co.
H. O. HANFORD, Plymouth, Wayne Co.
F. L. REED, Olivet, Eaton Co.
A. F. WOOD, Mason, Ingham Co.
F. V. SMITH, Coldwater, Branch Co.
J. Q. A. BURRINGTON, Tuscola, Tuscola Co.
M. P. ANDERSON, Midland, Midland Co.
JOHN GILBERT, Ypsilanti, Washtenaw Co.
C. A. HARRISON, Paw Paw, Van Buren Co.

Terms expire January, 1885.

J. M. STERLING, Monroe, Monroe Co.
WM. BALL, Hamburgh, Livingston Co.
J. L. MITCHELL, Jackson, Jackson Co.
A. O. HYDE, Marshall, Calhoun Co.
W. H. COBB, Kalamazoo, Kalamazoo Co.
E. W. RISING, Davison Station, Genesee Co.
PHILO PARSONS, Detroit, Wayne Co.
I. H. BUTTERFIELD, JR., Port Huron, St. Clair Co.
JOHN LESSITER, Jersey, Oakland Co.
WM. CHAMBERLAIN, Three Oaks, Berrien Co.

EX-PRESIDENTS.

GEO. C. MUNRO, Jonesville, Hillsdale, County.
M. SHOEMAKER, Jackson, Jackson County.
JAMES BAILEY, Birmingham, Oakland County.
H. G. WELLS, Kalamazoo, Kalamazoo County.
W. G. BECKWITH, Cassopolis, Cass County.
W. J. BAXTER, Jonesville, Hillsdale County.
GEO. W. GRIGGS, Grand Rapids, Kent County.
CHARLES KIPP, St. Johns, Clinton County.
E. O. HUMPHREY, Kalamazoo, Kalamazoo County.
W. L. WEBBER, East Saginaw, Saginaw County.
GEO. W. PHILLIPS, Romeo, Macomb County.

STANDING COMMITTEES.

Business Committee—Wm. COBB, Kalamazoo; A. O. HYDE, Marshall; F. V. SMITH, Coldwater.

Transportation Committee—J. M. STERLING, Monroe; W. L. WEBBER, East Saginaw; W. J. BAXTER, Jonesville.

Committee on Finance—Wm. BALL, Hamburgh; E. W. RISING, Davison Station; M. P. ANDERSON, Midland.

Committee on Premiums—Wm. BALL, Hamburgh; Wm. CHAMBERLAIN, Three Oaks; I. H. BUTTERFIELD, Jr., Port Huron; JOHN LESSITER, Jersey; H. O. HANFORD, Plymouth; A. F. WOOD, Mason; W. H. COBB, Kalamazoo.

Committee on Rules—C. A. HARRISON, Paw Paw; J. Q. A. BURRINGTON, Tuscola; GEO. W. PHILLIPS, Romeo; J. M. STERLING, Monroe; A. F. WOOD, Mason.

Committee on Reception—PHILO PARSONS, Detroit; M. SHOEMAKER, Jackson; W. G. BECKWITH, Cassopolis.

Committee on Programme—F. V. SMITH, Coldwater; A. O. HYDE, Marshall; GEO. W. PHILLIPS, Romeo.

Committee on Printing—A. J. DEAN, Adrian; J. C. STERLING, Monroe; JOHN LESSITER, Jersey.

General Superintendent—E. O. HUMPHREY.

Chief Marshal—A. O. HYDE.

EXECUTIVE SUPERINTENDENTS.

Cattle—I. H. Butterfield, Jr.

Horses—F. V. Smith and Geo. W. Phillips.

Sheep—D. W. Howard.

Swine—John Lessiter.

Poultry—J. Q. A. Burrington.

Miscellaneous—Wm. Chamberlain.

Fine Arts—C. A. Harrison and Philo Parsons.

Music—M. P. Anderson.

Children's Department and Needle Work.—Miss Minnie Brow.

Manufacturers—A. F. Wood.

Agricultural—J. L. Mitchell.

Machinery—Wm. Chamberlain.

Farm Implements—H. O. Hanford and Abel Angel.

Dairy—F. L. Reed.

Vehicles—John Gilbert.

Bees, Honey, etc.—W. J. Baxter.

Forage—E. W. Rising.

Police—J. M. Sterling and Wm. Ball.

Gates and Gate Keepers—Wm. Ball and J. M. Sterling.

PROCEEDINGS OF THE MICHIGAN STATE AGRICULTURAL SOCIETY FOR THE YEAR 1882.

LANSING MEETING.

Hudson House, Lansing,
June 11th, 1882.

The Executive Committee met pursuant to a resolution adopted at its annual winter meeting, and was called to order by President Fralick.

Upon the call of the roll the following members answered to their names: President Fralick, Treasurer Dean, Messrs. J. M. Sterling, E. W. Rising, H.

O. Hanford, John Lessiter, Wm. H. Cobb, J. L. Mitchell, A. O. Hyde, F. L. Reed, F. V. Smith, J. Q. A. Burrington, A. F. Wood, Wm. Chamberlain, Philo Parsons, D. W. Howard, C. A. Harrison, I. H. Butterfield, Jr., John Gilbert, M. P. Anderson, and the Secretary. Mr. J. M. Sterling, Chairman of the Transportation Committee, reported for that committee that arrangements for the transportation of stock and articles for exhibition at the State Fair were completed; that all railroads in the State save the L. S. & M. S., and the Canada Southern, will carry freight free, and that passengers will be carried to Jackson and return during the fair, on all roads, for the price of a single fare. Mr. Dean, Chairman of the Committee on Printing, reported five thousand copies of the premium list printed and in the binder's hands, and that they would be ready for distribution in a few days.

Chairman Gilbert of the Business Committee reported showing the condition of the property of the Society on the Detroit Fair Grounds, and stated that the committee had rented the ground occupied by the Society's buildings for another year.

Mr. Gilbert then requested the superintendents present who wished for additional stalls, or buildings in their departments, to make known their wants.

Remarks were made by most of the superintendents relative to the probable requirements of their respective departments.

President Abbot invited the committee to visit the Agricultural College and take dinner with the Faculty.

Mr. Hyde moved, and it was supported by Mr. Parsons, that the invitation be accepted with thanks, and that the committee start for the college at 12 o'clock noon, to-morrow.

It was moved to amend by inserting 7 o'clock, A. M., in place of 12 o'clock noon. The amendment was accepted and the motion as amended adopted.

The President then appointed as a special committee to examine into the management of the College and College Farm, and to make a report to this Board, Messrs. Parsons, Butterfield and Reed.

Mr. Chamberlain stated that Mr. Hewitt, the gentlemen in charge of "Michigan Crop Reports" wished the Society to furnish a complimentary ticket to the State Fair for each of the "Michigan Crop Report" correspondents, of which there is one in each township.

On motion the matter was tabled.

On motion the committee adjourned to meet Thursday, A. M., at 11:30 o'clock.

The President called the Board to order as per adjournment. There being no business on hand, the meeting was adjourned *sine die*.

J. C. STERLING, *Secretary*.

HENRY FRALICK, *President*.

PROCEEDINGS AT THE THIRTY-FOURTH ANNUAL FAIR, HELD AT JACKSON, SEPTEMBER 18TH TO 22D, 1882.

FIRST DAY.

HIBBARD HOUSE, JACKSON,
Monday Evening, Sept. 18th, 1882.

Executive Committee met and was called to order at 8 o'clock P. M., by President Fralick.

Roll called.

Present, President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Cobb, Lessiter, Hyde, Reed, Smith, Mitchell, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Anderson, Baxter, and the Secretary.

The committee appointed to investigate late entries reported in favor of accepting the entries of Messrs. S. A. Grow of Greenville, H. H. Tucker, Concord, Frank Noble, Grand Rapids, and E. Driggs, Palmyra.

The yeas and nays were called for and the report adopted by the following vote:

Yeas—Messrs. Hanford, Cobb, Burrington, Reed, Smith, Wood, Chamberlain, Parsons, Gilbert, Harrison, Anderson, Baxter, President, and Treasurer—14.

Nays—Messrs. Sterling, Rising, Ball, Lessiter, Hyde, Angel, Howard, and Butterfield—8.

It was then voted to proceed to the election of three inspectors of election. The following named gentlemen were duly chosen as such inspectors: Messrs. M. Dorrell, Jackson, A. Wheeler, Adrian, and Judge Mells, Paw Paw.

Mr. Ball moved that exhibitors be allowed to enter and show stock in classes above their ages, if they so desire. The motion was lost.

Mr. Smith moved and it was supported that the entries of Messrs. A. L. Smith, and L. Dean, of Gerard, be accepted. After a lengthy discussion on the question, Mr. Smith withdrew his motion.

Mr. Baxter moved the reconsideration of the vote adopting the report of the Committee on Late Entries. The motion prevailed.

Leave being granted, Mr. Dean, chairman of the committee, withdrew the report. Mr. Rising moved that the rules governing entries be strictly adhered to.

Mr. Ball offered as a substitute that the gentlemen whose entries were received after the time named for entries to close be allowed to exhibit their stock, and to have all the privileges of other exhibitors, except the right to compete for premiums, and that the rules be strictly adhered to. After some debate, Mr. Ball's motion was withdrawn.

Mr. Rising then withdrew his motion.

Mr. Baxter moved that the rules be construed as follows: That all entries shall be in the hands of the secretary on or before the time named for entries to close.

Mr. Baxter withdrew his motion.

Mr. Cobb moved, and it was supported, that the rules be so construed that all entries received bearing date not later than the day following the date for entries to close be accepted.

The motion was tabled.

Mr. Chamberlain moved that the construction of the rules governing entries for this exhibition be as follows: That all entries bearing date of day entries are advertised to close, and postmarked not later than the day after, be accepted.

Mr. Harrison moved as an amendment that all entries dated not later than the 12th and postmarked not later than the day following be accepted.

The amendment was lost.

Mr. Chamberlain's motion was then adopted.

A communication from Mr. Henry Haynes, protesting against horses being entered in more than one class, was read, and on motion referred to Superintendent Cobb.

The Committee on Late Entries asked to be discharged. The request was granted.

On motion the meeting was adjourned.

J. C. STERLING, *Secretary.*

SECOND DAY.

JACKSON, *Tuesday Evening, September 19th, 1882.*

Meeting called to order at 8 o'clock P. M., in the Hibbard House parlors.

President Fralick in the chair.

Roll called and the following members of the committee were present: President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Hyde, Reed, Smith, Wood, Chamberlain, Angel, Harrison, Butterfield, Gilbert, Baxter, and the Secretary.

Minutes of Monday evening's meeting read and approved.

Reports of superintendents called for. Reports all favorable.

A communication from Mr. David Clark, of Lapeer, making affidavit that his entries were mailed on the 12th inst., was received, and on motion tabled.

Mr. Gilbert presented a telegraph from Mr. B. F. Joslin, of Ypsilanti, offering to make a balloon ascension from the fair grounds.

The matter was, on motion, referred to the Business Committee with power.

On motion the meeting was adjourned.

J. C. STERLING, *Secretary.*

THIRD DAY.

JACKSON, *Wednesday Evening, September 20th, 1882.*

The Executive Committee met in the Hibbard House parlors at 8 o'clock P. M., President Fralick presiding.

Roll called: Present, President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Parsons, Cobb, Mitchell, Hyde, Reed, Burrington, Wood, Chamberlain, Angel, Howard, Harrison, Butterfield, Smith, Gilbert, Baxter, Phillips, and the Secretary.

Minutes of Tuesday's meeting read and approved.

The report of Miss Minnie H. Brow, Superintendent of Division Q, Children's Department, was read, showing total awards in that department $11.75. Report accepted and adopted.

Chairman Gilbert from the Business Committee, reported in relation to the communication from Mr. Joslin, referred to that Committee, that the Committee were not in favor of having a balloon ascension, and had so decided.

Mr. Joslin was introduced and addressed the meeting, giving terms, etc.

It was moved and supported that the report of the committee be accepted, and the action of the committee be sustained. Carried.

Mr. Parsons moved that a committee of three be appointed to investigate the propriety of selling the government bonds, now in the hands of the Treasurer, and investing the proceeds in other sureties. Carried.

Mr. Mitchell moved to reconsider the vote. The motion prevailed and the yeas and nays called on the original motion, which was lost by the following vote:

Yeas—Hanford, Reed, Mitchell, Hyde, Smith, Chamberlain, Parsons, Angel and President—9.

Nays—Sterling, Rising, Ball, Lessiter, Cobb, Burrington, Wood, Harrison, Howard, Butterfield, Gilbert, Baxter, Phillips, Treasurer, and Secretary—15.

On motion the communication from Mr. David Clark was taken from the table.

Mr. Clark was called and stated that his entries were mailed at Lapeer on the 12th inst., as stated in his affidavit.

Mr. Ball moved that Mr. Clark's entries be accepted. The motion was supported.

Mr. Baxter moved as an amendment that Mr. Clark's entries be accepted if by a microscopic observation the postmark cannot be determined.

The amendment was adopted.

A communication from Mr. E. A. Collins, protesting against a pair of matched carriage horses, entered in class 18, was read, and on motion referred to Superintendent Cobb.

Judge Marston was invited to address the meeting. The invitation was accepted, and upon motion a vote of thanks was tendered to the Judge for his able remarks.

Meeting adjourned.

J. C. STERLING, *Secretary.*

FOURTH DAY.

HIBBARD HOUSE, JACKSON,
Thursday Evening, Sept. 21, 1882.

Meeting of the Executive Committee called to order at 8 o'clock P. M.

President Fralick in the chair.

Roll called.

Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Lessiter, Hyde, Cobb, Mitchell, Howard, Angel, Reed, Wood, Smith, Burrington, Gilbert, Harrison, Ball, Parsons, Butterfield, Baxter, Chamberlain, Phillips, and the Secretary.

On motion of Mr. Baxter the reading of minutes was dispensed with.

Moved and supported that the Upton Manufacturing Company be allowed to remove their goods from the fair grounds to-morrow morning, under the directions of the superintendents in charge. Carried. On motion Messrs. Scarff, Pinney, and Langworthy, were given permission to take their cattle from the grounds before 4 o'clock, under the directions of Superintendent Butterfield.

Superintendent Cobb reported in relation to the protest against a span of matched carriage horses, referred to him at last evening's meeting, that he had measured the horses and found them to measure less than sixteen hands, and therefore recommended that the protest be not sustained.

Report accepted and adopted.

Superintendent Howard reported for Division C, that the Viewing Committees had completed their work and had awarded cash premiums to the amount of $1,152.00. The Prairie Farmer special premium was awarded to Mr. Wm. Ball.

Report accepted and adopted.

Superintendent Lessiter reported for Division D: Viewing Committee's work completed, they having awarded $656.00 in premiums.

Report accepted and adopted.

The report of Mr. S. W. Curtis, acting Superintendent of Division E, was read by the Secretary. The awards amounted to $316.00; $31.00 of this amount was for discretionary premiums.

Report accepted and adopted.

Mr. Chamberlain, Superintendent of Division K, reported for his department: Total cash awards, $13.00. Medals, three.

The report was accepted and adopted.

Miss Brow, Superintendent of Division O, reported premiums on enumerated articles awarded by Viewing Committee in this department, as $219.50 in cash, and one diploma. Premiums recommended on non-enumerated articles amount to $23.75. Total cash premiums, $243.25.

Report with recommendations accepted and adopted.

Treasurer Dean reported total gate receipts to date as $16,422.75.

Superintendents Harrison and Parsons reported regular premiums awarded in Division N, as $296.00, and recommended discretionary premiums amounting to $5.00.

Report with recommendations of superintendents accepted and adopted.

A protest against the award of the Viewing Committee on Farm Wagons made by the Austin, Tomlinson, and Webster Manufacturing Company, was read. After some discussion, the matter was, on motion of Mr. Cobb, referred to a committee of three to take evidence in the case and report at the winter meeting.

The President appointed as such committee Messrs. Cobb, Ball, and Gilbert.

A protest from Mr. Peas against Mr. Osborne's entries in classes 14 and 19 was read, and on motion tabled.

Mr. Gilbert, from the committee appointed at last winter meeting to receive propositions for permanent location of fair, reported that a proposition had been secured from citizens of Kalamazoo, and he introduced General Stockbridge, who addressed the committee on the subject and tendered the society the use of the Kalamazoo fair grounds for one or a term of years.

On motion the committee were continued and requested to report in full at next winter meeting.

Mr. Burrington, Superintendent of Division I, called the attention of the committee to the fact that a premium was offered in that department for a "Display of Vehicles," which required carriages and buggies to compete against farm wagons, etc. Superintendent Burrington recommended that the premium be divided, and a premium of one-half the amount be offered for display of wagons, and one-half for display of carriages and buggies.

It was moved and supported that Superintendent Burrington be granted the privilege of dividing the premium on display of vehicles, as suggested by him, if the competitors are agreed to it. Carried.

The report of the Inspectors of Election was read as follows:

The whole number of votes cast for officers and Executive Committee of the Michigan State Agricultural Society was seventy-eight, and they were cast as follows:

FOR PRESIDENT.

Henry Fralick, Grand Rapids, received	78

FOR SECRETARY.

Joe C. Sterling, Monroe, received	78

FOR TREASURER.

A. J. Dean, Adrian, received	78

FOR EXECUTIVE COMMITTEE.

J. M. Sterling, Monroe, received	78
Wm. Ball, Hamburgh, received	78
John L. Mitchell, Jackson, received	56
A. O. Hyde, Marshall, received	77
W. H. Cobb, Kalamazoo, received	78
E. W. Rising, Davison Station, received	78
Philo Parsons, Detroit, received	78
I. H. Butterfield, Jr., Port Huron, received	56
John Lessiter, Jersey, received	78
Wm. Chamberlain, Three Oaks, received	78
L. H. Butterfield, Jr., Port Huron, received	22
C. M. Fellows, Manchester, received	21

We hereby certify that the foregoing is a correct return of the votes cast at the election of officers of the Michigan State Agricultural Society at the annual election held at the Annual Fair, held at Jackson, September 21st, 1882.

(Signed), HENRY FRALICK,
President.
M. DORRELL,
ADOLF WHEELER,
CHAS. B. WESTREN,
Judges of Election.

The report was adopted, and the officers and first ten executive committeemen named were declared elected.

On motion the committee adjourned.

J. C. STERLING, *Secretary.*

FIFTH DAY.

HIBBARD HOUSE, JACKSON,
Friday Evening, Sept. 22, 1882.

The Executive committeee met at 8 o'clock P. M.

President Fralick in the chair.

Roll called. Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Cobb, Ball, Mitchell, Hyde, Reed, Burrington, Wood, Smith, Chamberlain, Harrison, Butterfield, Gilbert, Anderson, Baxter, Phillips, and the Secretary.

Treasurer Dean reported gate receipts as follows:

Monday	$88 00
Tuesday	533 75
Wednesday	5,451 25
Thursday	10,349 75
Friday	2,041 75
Total	$18,464 50

Mr. Ball was excused from further attendance at this meeting.

Mr. Baxter offered the following, which was unanimously adopted:

Resolved, That the Executive Committee of the Michigan State Agricultural Society, representing the agricultural, mechanical, and manufacturing interests of the State, fully recognize and appreciate the extended special provisions made to accommodate officers, members, and exhibitors of this Society, by the several railroad companies of the State, at the fair of 1882.

Resolved, That the thanks of this committee are especially due to General Manager Ledyard, Assistant General Manager Brown, Superintendent Bush, and Agent Richardson, for courtesies extended, and their untiring personal attention and efforts to facilitate the reception and removal of animals and articles exhibited, to the great relief of executive officers and the general satisfaction of exhibitors.

Superintendent Butterfield reported for Division A: Total awards of Viewing Committees, $2,899.50. The Superintendent further reported, recommending a special premium of $25.00 on a herd of Guernsey cattle, exhibited by Mr. C. H. Gibbs, of Pontiac, Mich.

Report with recommendation adopted.

A protest made by John Salsbury, M. C. Kellog, and O. L. Alger, against Mr. H. R. Baker's team of driving horses, entered in Class 16, was read, and on motion referred to Superintendent Cobb.

A protest against Mr. Ray Warner's entry in Class 14, made by John Powers, was read.

Moved and supported that the matter be referred to Superintendent Cobb. Carried.

Superintendent Anderson reported one premium of $10.00 awarded in his department, Division M.

Report accepted and adopted.

Superintendent Smith reported for Division L, showing $211.00 regular premiums awarded in that department, and recommending discretionary premiums, amounting to $10.00.

Report accepted and adopted with recommendations.

Superintendent Mitchell reported for Division F: Total awards $373.00. No discretionary premiums.

Report adopted.

Superintendent Reed reported for Division G: Regular premiums awarded amounting to $196.00. Discretionary premiums recommended, $5.00. Total, $201.00.

Report with recommendations adopted.

Mr. Burrington, Superintendent of Division J, reported that the premium on Display of Vehicles had been divided, and one-half the amount awarded on Display of Carriages, and one-half on Display of Farm Wagons. Total premiums awarded in the department, $203.00. Of this amount $56.00 is for discretionary premiums recommended by the Viewing Committee, and concurred in by the Superintendent.

Report with recommendations accepted and adopted.

Mr. Cobb, Superintendent of Division B, reported total awards, in that department, $2,689.00.

Report accepted and adopted.

Superintendent Baxter, of Division H, reported total premiums awarded in that department as $92.00.

The report was accepted and adopted.

Mr. Wood, Superintendent of Division P., reported premiums awarded on enumerated articles in that department as $26.00, and recommended discretionary premiums amounting to $15.00 in cash and two diplomas.

The report with recommendations was adopted.

Mr. Rising, Superintendent of Forage, reported the amount expended for hay and straw as $1,032.13.

The Secretary read a communication from Mr. Henry Haynes, asking the Society to award him the Free Scholarship offered to them by the "American Veterinary College of New York."

On motion the application was referred to the President with power to appoint.

Meeting adjourned.

J. C. STERLING, *Secretary.*

PROCEEDINGS OF THE EXECUTIVE COMMITTEE AT THE ANNUAL WINTER MEETING.

FIRST DAY.

Detroit, January 8, 1883.

The regular annual meeting of the Executive Committee of the Michigan State Agricultural Society opened in the parlors of the Michigan Exchange this evening, President Hon. Henry Fralick in the chair.

The roll was called and the following members answered to their names:

President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Ball, Lessiter, Cobb, Mitchell, Hyde, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Butterfield, Baxter, and the Secretary.

President Fralick read his annual address, as follows:

ADDRESS OF PRESIDENT FRALICK.

Gentlemen of the Executive Committee of the Michigan State Agricultural Society:

For this second mark of your confidence in my re-election as your President for another year, permit me to thank you. The best efforts of my head and heart are enlisted in the permanent success of this society, and to that end am ready with you to review the past and plan, revise and arrange, according to the best of our ability, for the future.

These meetings to me have become occasions of great pleasure, and I feel confident to most, if not all of you, as well as useful and profitable, if not indispensable, to the continued success of this society. Whether as a society or individual's progress, it is wise occasionally to review the past, to pause, well consider, and generalize our facts and position, to note well the stand-point at which we have arrived, aud from the store-house of past experience, draw just conclusions for action for the future.

Agriculture and its kindred arts are the real foundation of all human progress; without they prosper, neither national nor individual advancement can be made, or even the present status maintained.

Of the causes that in all countries and ages have given prominence to agriculture over all other pursuits, I need not remind this committee or society. It feeds, it clothes us; it supplies our daily wants; it is the foundation of the pursuits, usages, and benefits of civilization. Even among the most barbarous tribes, a mode of agriculture is practiced, and in proportion as man depends less upon the spontaneous products of the earth, and earns his bread by the sweat of his brow, just that measure is his nature exalted, and he becomes distinguished for intelligence, for social and material strength and progress, for commercial enterprise, for manufactures and arts, for respect to laws and religion. The primal curse is thus made a universal blessing.

Not only is agriculture the earliest of all arts, but we have abundant evidence that many ancient people were skillful husbandmen. The flocks and herds, the stores of fruit and grain, constituted the wealth and pride of eastern nations long before the polished eras of the Greeks and the Romans, and some of the most illustrious men among all nations have been tillers of the soil with their own hands.

But this art has been not only the precursor, but the sharer in the improvements of the age, and while other arts have been lost, there is no reason to suppose that agriculture has ever, for any length of time, retrograded, though its progress has often been slow, and in some respects it is even yet not materially in advance of the most enlightened nations of antiquity.

Many of the rules laid down by the best Roman and Greek writers for the proper cultivation of the soil, and the management of flocks and herds, are as judicious aud founded on as practical a conception of the fundamental laws of nature as modern times afford.

But that which distinguishes modern above ancient agriculture, arises from the advance made in the science of chemistry, geology, meteorology and mathematics, all of which have an intimate relation with the operations of agriculture, and where these are best understood and applied, agriculture is in its most flourishing state. In Europe, science has to be purchased at a high price, which but few comparatively can command, but to the great honor and advantage of Michigan, its school system, from the Primaries up to the University, is free to all, so that the poorest may reap as well as the rich, and we claim is not excelled in their proficiency in any of the States, and equally by few; and I feel confident that in the means of education for the promotion and improvement of agriculture and its kindred arts, from the Agricultural College, the State Agricultural and Horticultural Societies, and the various district and county societies, farmers' institutes, stock feeders' associations, State and local granges, our State will take rank with the best.

Let us then bestow upon the youth of our State the inestimable advantage of a thorough course of agricultural education. Let us teach them to view the occupation of their fathers not as a mere wearying, bodily labor, but as enlivened by the light of science, and worthy of the highest exertions of the most intellectual minds. In recommending the pursuit of agriculture to a wealth-seeking community like ours, the inquiry will at once be suggested, whether the profits of farming are sufficient to justify men of highly educated minds in adopting it as the business of their lives. I allude to the pecuniary profits alone, for it would be easy to show how many ulterior considerations, such as health and the better enjoyment of it, and the freedom from mental disquietude, constitute inducements of the strongest character. One thing is here especially to be noticed, that though the profits of farming, upon the capital invested, as compared with those *looked* for but rarely received by mercantile men, are confessedly small, yet the investment is, in at least nine cases out of ten, more safe and the returns more regular. Land is not fugitive property, it will neither run away nor burn up.

It is also observable that in all well managed farms, the land upon which the care and labor of the farmer are bestowed, is by the continued new investment made in improvements, constantly increasing in value; and many farmers of limited knowledge, who have struggled for years with small crops and low prices, at last find themselves comparatively rich, simply from the enhanced value of their farms. Compare the country through, we find no class in the community better off, with more of the real solid comforts, and even the better kinds of luxuries, than the farmers, and where science and skill are understood and applied, they never fail, either in the old States or the new, to become comparatively wealthy, while the proportion who become and remain so in commerce or by professional labor, is invariably small.

With a climate and soil suited to every variety of product that a civilized people require; with cheap lands, light taxes, free and good schools, just and wise laws, a healthy, intelligent, and moral people—what more is necessary to constitute this the most favored agricultural community on earth?

Nothing more than to avail ourselves of the benefits of science, and to establish and maintain those institutions whose oject is to diffuse a correct knowledge of the laws of nature—the statutes by which God governs the earth.

MANUFACTURES.

The business of manufacturing is one of the kindred arts of agriculture (and although ours is a comparatively new State) it has already become a very important element in our prosperity, and is rapidly increasing and extending its productions, and is entitled to, and should have, every encouragement that this Society can properly give.

A large share of the present productions of our factories is composed principally of wood, in which our State now abounds; but still it is not inexhaustible, like our coal, iron, copper, gypsum, and salt, and it, therefore, augurs well for the future of our State that our manufacturers are rapidly extending their business to all branches, and especially to all those based mainly on iron and copper, of which our State produces not only the best quality of both, but the supply is without limit as to time or quantity.

MACHINERY.

The exhibition of machinery has fallen off materially at our fair for the last three years, which is a matter of regret, as the home production of all kinds of machinery used in the State is important. As our manufactures multiply and expand, the demand for first-class machinery will increase. We have plenty of all kinds of materials necessary, and we certainly have the skilled workmen to manufacture it. This subject should have a careful consideration, and, if possible, adopt some method to induce the production of all, or nearly all the machinery required in the State by our own manufacturers, thereby not only saving a large amount of money annually to our own citizens, which now goes out of the State, bnt foster and promote the education of our own people in this important and indispensable branch of industry.

NORTHERN EXHIBIT.

There has been no exhibition at our last two fairs, of what is understood as the "Northern Exhibit," as such; the two preceding years to that they made a very fine and interesting exhibition, largely of their soil productions. It very naturally attracted a good deal of attention, and elicited much inquiry, and undoubtedly was one of the causes of the rapid advance that has been made in the sale of lands, and the many improvements in the Upper Peninsula, and the northern part of the Lower Peninsula, in the last four years.

I think the subject an important one, and that a liberal policy extended to that part of the State by our Society would be wise, just and remunerating, and recommend that the subject be referred to a special committee.

FINE ARTS.

The display in this branch of our exhibition last fall, was very good. I would recommend that the most liberal encouragement, consistent with the means of the society, be given to this department. A large and well selected display of good paintings, engravings, and chromos (to which I would also add plants and flowers), add largely to the attractions of our fair. They are highly appreciated by the best educated and most cultured of our visitors, and an efficient means of a desirable education to the eye, improves the taste, refines the mind, and thereby has not only a pleasing, but beneficial effect on all classes.

NEEDLE AND FANCY WORK.

This has been a very interesting and attractive exhibition for the last five years at our fair, and especially largely increased in the last two years, not only in quantity and quality of the exhibit, but also in its attraction under the efficient management of its present superintendent. It has been a very desirable department for our lady visitors to spend an hour or two daily. I trust its advancement will continue.

The Children's Department, also under the same supervision, has become not only very attractive, but also very instructive to the children and youth visiting the fair.

PREMIUM LIST.

This part of our work is of very great importance, as on its liberal, well considered, and properly adjusted premiums much of the permanent success of this society, and its benefits to the public, depends. I recommend a careful review of the whole list. Some changes undoubtedly are proper and necessary. In my judgment, the premiums should be materially increased on all the important cereals, grasses, dairy products, and wools, of the most desirable kinds, as they are all valuable products of the State, and our premiums on them heretofore, have not been sufficient inducements to encourage their production and exhibition in that quantity and quality that their importance demands. The business and aim of this society, is to foster and encourage all proper and valuable industries of the State, but that must be done within our legitimate means, the society must be self-supporting. The premium list should be as large as the safe financial point will permit, but must be judiciously adapted and wisely discriminating to make successful fairs.

JUDGES AND AWARDING COMMITTEES.

Our rules now authorize the superintendents of the various departments to select and engage their Awarding Committees preceding the fair. Much of the permanent success of the society depends on the ability and impartiality of the judges selected. That important duty should be carefully and conscientiously performed, and in sufficient time to verify their acceptance of the trust before the commencement of the fair. Our rules guard them from all interference in their assigned duties. In many divisions they are arduous and require much firmness, experience, time, and close attention, but when that duty is faithfully and wisely performed, while some of the exhibitors may be a little disappointed in the result, they still will cheerfully abide such a decision.

FINANCIAL.

Our society has been reasonably successful financially, in the past year, as the report of the treasurer will show, that after all the expenses, premiums and claims of the year have been paid, we have added, including the interest on our invested fund, $1,295 to our surplus fund.

The weather was good, the exhibition large and generally satisfactory to our exhibitors and visitors. The receipts were not quite as large as at some of our previous fairs. Still they were very good, amounting in the aggregate to the sum of $23,453.75. From the apparent number of attendants, I was in hopes the amount to be added to the surplus fund would have been larger. I know that our Business Committee made every reasonable effort to keep the expenses as low as possible, and still have all the room and conveniences necessary for our exhibitors and patrons, and that the other officers generally, worked to the same end, but still the expenses seem larger than they ought to have been. I again recommend that each officer in his own department and generally keep their expenses to the lowest point possible, and yet provide all the necessary room, convenience and help, to accommodate our exhibitors and visitors in all proper ways and means, as that is indispensable to a successful fair. The aim of this society is not to see how large a sum they can accumulate, but how good and profitable an exhibition for the State and the education of its people in the best form and manner of agriculture and its kindred arts, they can make from year to year at reasonable charges for admission, and still have means sufficient in reserve to guarantee the payment of all claims for premiums and expenses in case of one or more unpropitious seasons which may come.

GENERAL POLICY.

In my judgment, the best interests of the society are promoted by a liberal policy in all our proceedings, not only with our exhibitors, but with our visitors, lessees of grounds, and those renting grounds and privileges from the society. But while this is and should be our policy, it is absolutely essential to our success as a society, not only financially, but to retain our good name, that our rules must be adhered to in all particulars. They do not allow the selling of intoxicating drinks, nor of any immoral or improper exhibitions of any kind, nor of any gambling within our gates. Eating booths, shows of any kind which the rules permit, not belonging to our exhibition, renting grounds and privileges must be made to comply with the rules of the society, or vacate the grounds promptly.

They must be assigned and confined to a space sufficient distance from all our fair exhibits, that ample passage way and standing room may and shall at all times be maintained for all visitors.

The crowded state of the grounds at our last fair rendered it almost impossible to carry out these rules, and they were undoubtedly somewhat infringed upon, and as a result, so far a reproach to the society; it must not occur again.

ADMISSION TO THE FAIR.

The present general system of admission tickets is satisfactory with the exception of tickets for the admission of exhibitors and persons renting grounds of the society for various purposes, for themselves and their employes. I recommend a change in so far that those tickets will be received only at a certain gate or gates set apart for the entrance of such persons; and that no persons, employes or others, be admitted without tickets after eight o'clock A. M.

RULES.

I recommend that the rules of each division be printed on the back of each entry list of said division, in addition to their being printed in the premium list; and that marginal notes be printed on all the rules and regulations in the premium list.

SORGHUM.

A few weeks ago, I found the following article in an agricultural paper, viz.: "The successful application of the process for making sugar from sorghum, discovered by Professors Scoville and Weber, of the Illinois Industrial University, has caused great excitement all over the State, and farmers are getting ready to go into the sorghum business, which will give them a larger profit to the acre than any other product. Of 250 acres, the company which has been using the new process had produced 125,000 pounds of sugar and 22,500 gallons of molasses, valued at $19,000, or an average of $76 to the acre." If the sugar and syrup, made from the sorghum as above stated, can be manufactured at a reasonable price, with the flavor of good cane sugar, it will be a very valuable production to the country, and save millions of dollars in the way of duties on foreign and the enhanced price for the home production of cane sugar to the consumers, of whom a very large majority are poor or of small means, and in that sense would be a great benefit to those most needy. I recommend a suitable premium be offered for a satisfactory sample or samples of sugar and molasses made by said process from sorghum, with a clear and concise statement of how it is produced or manufactured.

FORAGE.

In the forage department, I recommend the purchase and use of suitable scales for weighing the hay and straw furnished exhibitors, and the adoption and carrying out the same rule with regard to the distribution of forage as that adopted at the Centennial Exhibition of 1876. The department has become difficult as well as expensive to manage under the old system (even with the present able and experienced superintendent), and have no doubt the change would accommodate the stock exhibitors as well, or better, with less trouble to the superintendent, and a large saving of expense to the society.

BEE CULTURE.

The Bee Keepers' Association, at their late meeting in Kalamazoo, resolved to make a grand exhibit of honey, its product, at our next State Fair, if a suitable building would be provided for them by the society; and have appointed their Secretary to attend our meeting to make known their wants and necessities.

They had a good exhibition at our last fair and it attracted considerable attention. They ask for larger and better discriminating premiums than last year, with privilege of sales under the rules. I recommend the association be generously treated and all their reasonable requests granted.

HORTICULTURAL SOCIETY.

This society made a large and very satisfactory exhibition at our last fair. Their work is of great value to the people of the State and a valuable auxiliary to the State Agricultural Society. It has its peculiar work which has been successfully and creditably performed. So successful and thorough has been their work that the whole State has been greatly benefited in the increased and valuable productions of improved fruits, plants and flowers. Their system in disseminating useful information by holding frequent meetings most of the season in different parts of the State, in which lectures are delivered and appropriate papers prepared and read by competent persons bearing directly on all the important subjects embraced in their organization, it thus brings desirable knowledge in its most practical form within reach of almost every person interested in horticulture in the State, their work is still making favorable progress. I recommend said society be invited to continue its co-operation with us, and that the same sum be appropriated under the rule for their use as last year.

AGRICULTURAL COLLEGE.

For the last four years, by the invitation of the State Board of Agriculture and officers of the Agricultural College, this committee have enjoyed the pleasure of visiting and examining the college, its school and lecture rooms, classes and manner of teaching their pupils, its farm and farm buildings, and valuable, improved stock, and the manner of cultivating their land.

The college is thoroughly practical in its aims and objects, its classes are taught in the field as well as in the recitation rooms; no time or attention is given to the ancient, but thorough training in the English language and literature is provided for and carried out; especial attention is given to the practical sciences and their application; the results of the operations of the college are given in the annual report of the State Board of Agriculture; much valuable information is imparted by the members of the faculty in the form of practical lectures at farmers' institutes and at the meetings of the State Horticultural Society, which is now frequently held in all parts of the State, and which in that form have proved of much value to the farmers of Michigan.

I have lately received a cordial invitation from the President of the College and the State Board of Agriculture to the Executive Committee and the officers of the society to repeat our visit to the college on the second Wednesday of June next. I respectfully recommend the invitation be accepted.

THE FAIR CIRCUIT.

The arrangement remains the same as last year, the agreement between the several Agricultural Societies included in what is styled the "Fair Circuit." The several fairs were held in regular succeeding weeks, commencing at Columbus, August 28, then to Cleveland and Toledo, Ohio, then to Jackson, Michigan, then to Indianapolis and Waterloo, Indiana. The only change made last year was, there was no fair held at Cleveland, but a two weeks' fair at Toledo.

Representatives from each of said societies attended our last winter meeting and gave us much valuable information in reference to their own States, and manner of conducting their fairs, etc., and invited our Executive Committee, including the officers of the society, to attend their annual fair, and also their winter meeting. A committee was appointed from the society to attend the fairs held last fall, who undoubtedly will make a full and interesting report, from which this society will receive valuable information, and make such recommendations as in their judgment may seem proper.

OFFICERS.

The officers, superintendents, and committees have, with slight exceptions, performed their duties faithfully and satisfactorily. The duties of the offices of the secretary and treasurer, which are so important to the best interests of the society, have been singularly well performed in every way to the credit of themselves and the society, as have also the duties of the principal committees. The duties of the chairman of the Business Committee are very important and especially arduous, but they have been well and satisfactorily performed, but it takes too much of his time, more than the society ought to receive without remuneration, and the only way for us to equalize is to take turns at the hard work, as our rules do not allow us to pay money for such services.

THE LOCATION OF THE NEXT FAIR.

The location of the next fair is always an important question. The society has a large amount invested in buildings, a part of them in Detroit and a part in Jackson. If used on the grounds where they are, they can be utilized to good advantage and save a large amount of money to the society, but if moved to some other point, they of course are largely reduced in value by their taking down and rebuilding, but that is one of the unfavorable incidents attaching to our migratory character. I do not see how it can be remedied, unless by a permanent location (to which I am opposed), but I think it can be largely obviated by making some arrangement whereby we may have the necessary permanent buildings to occupy in three or four different localities in the State, which may be erected jointly by the State Society and the locality, to be occupied by the society for two years in each place. Such an arrangement, wisely made and carried out, would, in my judgment, settle the question of locality which is always a perplexing one, save a large amount of annual expenditure and trouble to the State Society, and also enable each of said localities to erect permanent buildings, and each of the towns would be in competition with the others to have the best buildings, not only as a convenience to the State Society, but a pride to the locality.

With such an arrangement the difficult question of the location of the annual fair for a term of years, can be satisfactorily adjusted and settled. With that accomplished, I shall feel that the society has finally solved the problem that has troubled them for many years; it will be a great relief to the committee from year to year, and I trust a permanent benefit to the society.

Gentlemen of the committee, I again thank you for your confidence, and respectfully submit the foregoing brief *résumé* for your consideration.

On motion of Mr. Baxter, the address was referred to a committee of three for subdivison of subjects.

Messrs. Baxter, Parsons, and Smith were then appointed as such committee.

The secretary then read his report as follows:

SECRETARY'S REPORT.

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN,—I have the honor to submit the following report as a statement of the transactions of the secretary's office for the year 1882:

Three hundred and twenty-one warrants, amounting to $11,579.81, were drawn upon the treasurer for the payment of accounts as audited by the Business Committee and countersigned by the chairman of that committee. A record of the above orders will be found in the register of accounts for 1882, and upon the stubs of the orders; vouchers corresponding with the orders are on file in the secretary's office. The details of the general expenditures of the society have been classified and arranged under the proper heads; the items will be found in the report of the Business Committee.

Four hundred and one checks, amounting to $9,669.50, were issued by the secretary and countersigned by the president for premiums awarded at the 34th annual fair. Three checks were issued for the payment of premiums awarded at the fair of 1881, and amount to $56, making the total amount of premium checks drawn on the treasurer during the year $9,725.50. A full and detailed statement giving the number of the check, amount, and name of the party to whom issued, will be found in the schedule accompanying this report.

The following table exhibits the amounts offered in each division by the premium list of the society, the amount paid in each division, and also a statement of the medals and diplomas offered and issued:

CASH PREMIUMS.

DIVISION.	Offered.	Awarded.
A—Cattle	$3,921 00	$2,924 50
B—Horses	3,572 00	2,829 00
C—Sheep	1,184 00	1,152 00
D—Swine	701 00	656 00

CASH PREMIUMS.—*Continued.*

DIVISION.	Offered.	Premium.
E—Poultry	$360 00	$316 00
F—Farm and Garden Products	584 00	467 00
G—Dairy and other products	231 00	201 00
H—Bees, Honey, etc.	115 00	92 00
I—Farm Implements		
J—Vehicles	215 00	191 00
K—Machinery	415 00	13 00
L—Manufactured Goods	595 00	221 00
M—Surgical and Musical Instruments, etc.	104 00	10 00
N—Art Department	465 00	301 00
O—Ornamental Needle Work	366 50	243 25
P—Miscellaneous Articles	113 00	41 00
Q—Children's Department		11 75
	$12,941 50	$9,669 50
Horticultural Department	1,362 40	872 50
Total	$14,303 90	$10,542 00

The Horticultural Department was under the general supervision of the State Horticultural Society, and premium checks for the awards of the department were drawn upon Treasurer Dean by the secretary of that society.

MEDALS AND DIPLOMAS.

DIVISION.	MEDALS.		DIPLOMAS.	
	Offered.	Awarded.	Offered.	Awarded.
D—Swine			5	5
K—Machinery	9	3	1	
L—Manufactured Goods	1		1	1
M—Surgical Instruments, etc.			7	
O—Furs and Needle Work			2	1
P—Miscellaneous	3			2
Total	13	3	16	9

SPECIAL PREMIUM.

A silver water pitcher, offered by the Prairie Farmer Publishing Co. in Division C, was awarded to Mr. Wm. Ball, of Hamburgh, Mich.

UNPAID PREMIUMS.

In Division B, Class 14, a three-year-old gelding exhibited by Mr. Ray Warner, of Coldwater, Mich., was awarded a premium of $10. This award was protested and the question referred to a committee to be reported at the winter meeting. A pair of gents' driving horses entered by Mr. H. R. Baker, of Jonesville, Mich., was protested, the premium being $30. The protest was referred to the same committee.

The first premium on farm wagon was awarded to the Lansing Wagon Co. This award was also protested; the premiums were, 1st $10, 2d $5. The matter was referred to a committee to take evidence and report to the Executive Committee at its annual meeting.

The total amount of premiums protested is $55.

The following is a list of entries in each class and division:

DIVISION A—CATTLE.

Class.		
1—Short-horns	113	
2—Devons	39	
2—Herefords	6	
4—Ayrshires	39	
5—Jerseys	80	
6—Galloways and Polled Angus	24	
7—Holsteins and Dutch Frieseans	90	
8—Grade Cattle	41	
9—Working Oxen and Steers	10	
10—Fat Cattle	17	
11—Herds	34	
Special—Guernseys	7	
Total		500

DIVISION B—HORSES.

Class.		
12—Thorough-breds	89	
13—Horses of all work	114	
14—Roadsters	47	
15—Breeders' Stock	72	
15—Gents' Driving Horses to Road Wagon	32	
17—Draught Horses	40	
18—Carriage and Buggy Horses	35	
19—Michigan Horses, Roadsters, and Thorough-breds	25	
20—Michigan Horses, Mares, and Geldings	53	
20½—Michigan Horses, Thoroughbred Stallions, Mares and Geldings	14	
21—Sweepstakes for Stallions with six of his get	11	
Total		532

DIVISION C—SHEEP.

Class		
22—Thorough-bred American Merinos	208	
23—Fine Wool Grades	27	
24—Southdown	35	
25—All Middle Wool Sheep other than Southdowns	101	
26—Leicesters	34	
27—Cotswolds and other Long-wooled Sheep	51	
28—Grade Coarse-wooled Ewes	15	
29—Fat Sheep	17	
Special—Merino Ram and two Ewes	15	
Total		503

DIVISION D—SWINE.

Class.		
30—Berkshire	52	
Essex	50	
Suffolk and Small Yorkshire	67	
Poland China	41	
Chester White and Large Yorkshire	29	
Fat Hogs	9	
Total		248

DIVISION E—POULTRY.

Class.		
31—Poultry		420

DIVISION F—FARM AND GARDEN PRODUCTS.

Class.		
32—Grain and Seeds	79	
33—Roots and Vegetables	203	
34—Flour, Meal, and Feed	21	
Total		303

DIVISION G—DAIRY PRODUCTS.

Class.		
35—Butter, Cheese, and Dairy Articles	68	
36—Sugar, Bread, and Pickles	62	
Total		130

DIVISION H—BEES, HONEY, ETC.

Class.		
38—Bees, Honey, etc		47

DIVISION I—FARM IMPLEMENTS.

Class.		
39—Plows	43	
40—Tillage Implements	33	
41—Seed Drills, Sowers, Planters, etc	48	
42—Haying and Harvesting Implements	124	
43—Machinery for Preparing Crops for Market, etc	58	
44—Miscellaneous Farm Articles	34	
Total		340

DIVISION J—VEHICLES.

Class.		
45—Wagons and Carriages, and Buggies		145

DIVISION K—MACHINERY.

Class.		
46—Machinery for Working upon Metal	11	
47—Miscellaneous Machinery	3	
Total		14

DIVISION L—MANUFACTURED GOODS.

Class.		
48—Materials	13	
49—Factory-made	1	
50—Articles of Dress	3	
51—Articles of Leather and India Rubber	30	
52—Articles of Furniture	47	
53—Stoves, Iron, and Concrete Work	20	
Total		114

DIVISION M—SURGICAL AND MUSICAL INSTRUMENTS.

Class.		
54—Surgical Instruments, etc		13

DIVISION N—DEPARTMENT OF ART.

Class.		
56—Painting and Sculpture		237

DIVISION O—NEEDLE-WORK.

Class.		
58—Articles of Ladies' Dress	10	
59—Plain Needle and Machine Work	72	
60—Embroidery and Ornamental Needle-Work	172	
61—Crochet, Knit and Fancy Work	76	
62—Hair, Shell, and Wax Work	46	
Total		376

DIVISION P—MISCELLANEOUS.

Class.		
63—Miscellaneous Articles	36	
64—Household Articles	28	
Total		64

DIVISION Q—CHILDREN'S DEPARTMENT.

Children's Work	52

HORTICULTURAL DEPARTMENT.

Fruits, Flowers, etc.	1,200
Total entries in all Departments	5,238

Inventory of property in the Secretary's Office:

American Short-horn Herd Books	23 vols.
American Jersey Cattle Club Herd Register	9 vols.
American Devon Herd Book	5 vols.
Holstein Herd Book	5 vols.
Dutch Friesean Herd Book	1 vol.
Pedigrees of English Short-Horn Bulls	1 vol.
American Stud Book	3 vols.
Vermont Merino Sheep Register	1 vol.
American Berkshire Record	4 vols.
Michigan Farmer for years 1845 to 1854 inclusive, bound in	8 vols.

Several reports of State Boards of Agriculture of Michigan, Ohio, Indiana, Illinois, Iowa, Kansas, Missouri, Massachusetts, Connecticut, New Hamphire, Maine, California, Upper Canada Department of Agriculture, and the State Horticultural Society.
1 Office Desk.
1 Old Trunk.
5 Boxes for Books.
1 Society Seal.
1 Postal Scale.
1 Gold Medal.
6 Ink Stands.
1 Pair Shears.
2 Letter Files.
1 Bill File.
20 Spindles.

During the year there has been filed in this office articles of association of the "Ottawa and West Kent Agricultural Society," "Emmet County Agricultural Society," and the "Brooklyn Union Agricultural Fair Association."

One life membership was issued to Mr. M. P. Anderson, of Midland, Mich., for which $10 was received and paid over to the Treasurer and his receipt taken for the same.

J. C. STERLING,
Secretary.

On motion the report was referred to the Committee on President's Address.

Treasurer Dean then submitted his annual report, which was as follows:

TREASURER'S REPORT.

FAIR HELD AT JACKSON, SEPTEMBER, 1882.

Jan., 1881.	Balance cash on hand at settlement	$21,932 81

RECEIPTS DURING THE CURRENT YEAR.

From John Gilbert, Chairman Business Committee	$3,812 75	
From interest account	400 00	
From sale of membership certificates	757 00	
From J. C. Sterling, Secretary	10 00	
From William Ball	3 00	
From J. M. Sterling	5 00	
From Henry Fralick	50	
From A. O. Hyde	50	
From H. O. Hanford	50	
From admission to fair-grounds	18,464 50	
		$45,386 56

DISBURSEMENTS.

Paid business orders, 1882	$11,579 81	
Paid premium checks, 1882	9,631 50	
Paid premium checks, 1879	1 00	
Paid premium checks, 1880	1 00	
Paid premium checks, 1881	12 00	
Paid premium checks, 1882, old issue	56 00	
Paid Horticultural premium checks, 1882	877 40	
Balance cash on hand	23,227 85	
		$45,386 56

Of the above balance there is invested in the name of the society, $10,000, face value, in four per cent registered United States bonds, which at the present rate of premium would enhance the actual cash assets of the society, in gross, to $25,227.85.

A. J. DEAN,
Treasurer.

DETROIT, *January 8, 1883.*

The report was, on motion, accepted, and referred to the Finance Committee.

It was moved and supported to reconsider the action of the committee referring the report of the Secretary, to the Committee on President's Address. The motion prevailed, and the report was on motion referred to the Committee on Finance.

The Secretary read the summary of the Business Committee's report.

On motion, the report was accepted and referred to the Committee on Finance, without further reading.

STATEMENT OF BUSINESS COMMITTEE IN DETAIL.

EXPENSE OF WINTER MEETING.

1882.	*Order No.*		
Jan. 12,	2	H O. Hanford, expenses	$3 25
	3	F. M Manning, "	5 80
	4	Thorndike Nourse, stationery	2 60
	5	J. M. Sterling, expenses	2 54
	6	Geo. W. Phillips, R. R. fare to Jackson. Detroit, etc	12 71
	7	F. L. Reed, expenses	6 80
	9	A. F. Wood, "	6 70
	10	J. Q. A. Burrington, expenses	5 50
	11	J. L. Mitchell, expenses	4 60
	12	John Lessiter, "	5 55
	13	W. G. Beckwith, "	8 00
	14	C. A. Harrison, "	7 05
	15	J. H. Butterfield, "	3 40
	16	M. P. Anderson, "	9 10
	17	Henry Fralick, "	4 75
	18	F. V. Smith, "	5 80
	19	Abel Angel, "	7 40
	20	A. O. Hyde. "	4 00
	21	A. J. Dean, "	7 65
	22	W. H. Cobb, "	6 05
	23	William Ball, "	4 85
	24	C. W. Greene, "	3 60
	25	E W. Rising, "	7 50
	26	D. W. Howard, "	11 50
	27	J. C. Sterling, "	2 32
	28	Wm. Chamberlain, "	7 40
Feb. 13,	32	Russell House, board of committee	331 75
	33	Detroit Free Press Co., printing proceedings	116 00
	34	John McKay, expenses	19 50
Mar. 16,	35	Monroe postmaster, stamps for reports of	3 00
	36	U. S. Express Co., express on reports	5 65
		Total	$632 32

PRESIDENT'S OFFICE.

1882.	*Order No.*		
Nov. 22,	226	Henry Fralick, President's expenses	$16 00
	313	Hibbard House, President's board	18 25
		Total	$34 25

TREASURER'S OFFICE.

Nov. 22,	197	Chas. Humphrey, stationery	$1 50
	228	Mrs. Oxtoby, board of clerks	34 00
	233	Morris Knapp, wagon to carry boxes to grounds	15 00
	262	Clerk hire, Treasurer's office	152 50
	267	Adrian postmaster, envelopes	16 30
	268	A. J. Dean, expenses of office	9 15
	313	Hibbard House, board Mr. Dean, $17.50; Mr. Comstock, $12; Mr. Colvin, $13.25; Mr. Wheeler, $1.25	44 00
Dec. 20,	320	A. J. Dean, book-keeper	400 00
		Total	$672 45

SECRETARY'S OFFICE.

Jan. 31,	30	J. C. Sterling, one-quarter salary as Secretary	$250 00
Mar. 16,	38	J. C. Sterling, first quarter salary as Secretary for 1882	250 00
July 26,	76	J. C. Sterling, second quarter salary as Secretary for 1882	250 00

1882.	*Order No.*		
Oct. 11,	182	J. E. Landon, ass't sec'y	$23 10
	183	A. E. Cook, "	19 60
	184	C. B. Westren, "	12 00
	185	W. Horton, "	16 00
	186	A. W. Cummings, "	16 00
	187	W. H. Huntress, "	12 00
	188	A. M. Dowell, "	14 00
	189	H. Murphy, "	14 00
	190	W. F. Church, "	12 00
	191	C. Sevenberg, "	16 30
	192	C. J. Phillips, "	21 15
Nov. 18,	196	J. C. Sterling, third quarter salary as Secretary	250 00
22,	284	Mr. Doney, board of ass't secretary	14 00
	285	Hurd House, board of ass't secretary	38 50
	286	Hurd House, board of ass't secretary	19 50
	287	J. M. Sterling, rent of office, gas, fuel, etc	50 00
	289	James York, chest and shelves for office	8 73
	290	Avon Welch, board of ass't secretary	21 00
		Total	$1,327 88

GENERAL EXPENSES.

1882.	*Order No.*		
Jan. 12,	8	N. Arksey, assistant at Fair in 1879	$3 00
Feb. 13,	31	William Sukert, diploma wrappers	3 05
June 7,	72	Wm. Ball, expenses attending agricultural societies of Michigan	14 90
Aug. 12,	90	Messrs. Cobb & Hyde, personal expenses	11 55
28,	98	Brown & Pilcher, stationery	2 55
	99	Geo. A. Neat, 4 bags for ground pine	1 00
	102	James O'Donnell, 3 copies Citizen 2½ months	3 75
	103	Carlton & Van Antwerp, Patriot 2½ months	4 50
	107	Wm. Bickford, cartage on truck to Detroit depot	3 00
Sept. 22,	116	John Gilbert, sundry charges and personal expenses	16 99
	127	W. R. Hibbard, damage to plants in main hall	30 00
	128	Alex. Brown, damage to plants in main hall	2 00
	135	Tuomey Bros., 16 comfortables	16 00
	140	W. H. Addison, omnibus for ladies' band	1 00
Oct. 3,	160	Morris Knapp, carriage for Mr. Gibbons	2 00
	162	G. M. Stanley, use of lamps and 20 gallons oil	5 00
	167	J. H. Wortley, lamps, lanterns, etc	17 86
11,	173	Elliot & Morey, hay and oats	10 60
	175	H. C. Ransom, use and breakage of chairs	18 00
Nov. 22,	206	J. D. North, hack fair, etc.	2 00
	207	Western Union Co., telegraphing	10 09
	238	W. H. Cobb, personal expenses	26 21
	243	Geo. W. Phillips, expense attending fair	5 80
	251	Hibbard House, 1 quilt	1 50
	255	M. Dorril, inspector of election	6 00
	257	Knapp & Sutton, carrying 8 people to ground	2 00
	258	Peter Venier, one day's work	1 00
	259	Venier, Haywood & Co., labor	5 00
Nov. 22	263	A. Wheeler, inspector of election	$3 00
	271	A. J. Dean, material furnished	18 00
	273	Charles Tuppen, care of trees	8 00
	277	J. C. Sterling, expense to Jackson	13 23
	280	C. Keyser & Co., hardware	3 00
	291	Aaron Welch, board of A. Slater	7 00
	292	H. M. Dorril, clerk of election	2 00
	303	A. O. Hyde, personal expenses	12 08
	304	W. H. Cobb, personal expenses	12 40
	307	John Gilbert, cartage, telegraphing, etc	19 83
	308	O. E. Thompson, signs for bee department	6 00
	310	Mr. Palmer, sundry cartage	2 00
	311	W. H. Gilbert, clerk Business Committee	175 00
31,	314	Michigan Exchange, board committee; W. H. G. R. R. fare, etc	19 20
Dec. 20,	319	A. J. Dean, expenses attending Detroit meeting.	4 50
		Total	$531 59

PRINTING AND ADVERTISING.

June 7,	48	Detroit Evening News, bids for premium lists	$8 00
July 26,	75	Tri-State Fair Association, 300 circuit posters	9 00
	77	Democrat Printing Co., Monroe, letter heads, tags, etc	50 50
Aug. 12,	81	Evening News, Detroit, proposal for permanent location	14 40
	82	Evening News, Saginaw, proposals for permanent location	3 00
	85	Herald Printing Co., East Saginaw, proposal for permanent location	1 50
	86	Courier Printing Co., East Saginaw, proposal for permanent location	1 50
	92	C. R. Pattison, Ypsilanti, circulars for power	1 00
Oct. 11,	193	F. D. Hamilton, premium lists, etc	224 60
Nov. 22,	200	Carlton, Van Antwerp & Co., sundry printing	37 15
	237	Kalamazoo Publishing Co., posters	189 55
	240	Jas. O'Donnel, programmes, etc	19 50
	241	Jas. O'Donnel, catalogues	35 00
	245	Adrian postmaster, postage stamps	6 12
	246	Geo. F. Payne, Committee and Entry Books	61 00
	249	Calvert Lithographic Co., complimentaries	30 00
	261	Kalamazoo Gazette, advertising	2 00
	266	Johnston & Gibbons, publishing awards	75 00
	272	A. J. Dean, expenses as chairman of committee	56 00
	275	O. S. Gulley & Co., printing tickets	84 03
	278	J. C. Sterling, expenses to Detroit	6 45
	295	A. E. Cook, clerk of committee	12 75
		Total	$928 05

POSTAGE.

1831.	Order No.		
June 7,	46	Monroe postm'r, postage for secretary's office	$10 00
	47	Monroe postmaster, 500 cards for secretary's office	5 00
July 26,	74	Monroe postm'r, postage for Secretary's office	12 00
	78	Monroe postm'r, postage for premium lists	15 00
Aug. 12,	80	Ypsilanti postmaster, postage for Business Committee	3 00
	89	Ypsilanti postmaster, postage for Business Committee	5 00
31,	111	Shemeld & Cook, postage for Business Committee	4 00
Oct. 11,	179	Monroe postm'r, postage for Secretary's office	10 00
	180	Monroe postm'r, postage for posters	12 00
	181	Monroe postmaster, postage for complimentaries	18 00
Nov. 22,	293	Monroe postmaster, postage for premium checks	15 00
		Total	$109 00

BUILDING, REPAIRS, AND LABOR ON GROUNDS.

1881.	Order No.		
Aug. 18,	96	Pay roll, labor on grounds and buildings	$63 50
28,	101	Farrand, Williams & Co., 7 boxes glass and 50 lbs. putty	21 68
	104	Pay roll, labor on grounds and buildings	80 63
	105	C. B. Bush, labor of men	16 50
31,	108	Pay roll, labor on grounds and buildings	87 00
	110	R. E. Emmons, man and team 6 days	24 00
Sept. 22,	112	Pay roll, labor on grounds and buildings	72 00
	118	Barnes Bros., 20 rolls roofing felt	23 58
	119	Pay roll, labor on grounds and buildings	85 30
	123	Pay roll, labor on grounds and buildings	112 44
	125	Frank Fessenden, wire fencing	10 00
	130	Lindemer Bros., plumbing, etc	8 42
	131	Cal. Simmons, R. R. fare on acc't of work	2 80
	133	Smith Bros., lime	4 40
27,	143	Pay roll, labor on grounds and buildings	198 21
Oct. 3,	152	Miles, Hyser & Co., lumber, planing, etc	128 24
	153	S. Hyser & Co., sawing circles	5 75
	155	Wells & Fuller, 1 keg nails	4 35
	156	E. T. Webb, oil, paint, etc.	9 23
	157	J. E. Woodruff, blacksmithing	5 65
	158	E. Dennis, straightening shaft	1 00
	163	Warner & Dodge, 24 feet rubber belting	15 46
	168	Phil. Duffy, work on water pipe	1 50
	169	R. E. Emmons, moving engine and team labor	52 00
	170	W. N. Hartrupee, hardware bill	112 99
	171	J. D. Price, use of water pipe	12 58
	172	Bennett Tile Company, 300 tiles	4 50
24,	194	Pay roll, cleaning up after fair	103 17
Nov. 22,	198	C. C. Pond & Co., lumber for ticket office	$1 06
		Total	$1,267 94

LUMBER.

July 29,	79	Wright & Knowlton, one car lumber	$122 06
Aug. 28,	106	Wright & Knowlton, 11,000 ft. mill culls at $5	55 00
Sept. 22,	113	Wright & Knowlton, 8,000 ft. mill culls at $5	40 00
		Total	$217 06

LANSING MEETING.

June 7,	50	J. M. Sterling, expenses	$6 15
	51	F. V. Smith, "	4 40
	52	F. L. Reed, "	2 50
	53	M. P. Anderson, "	8 25
	54	J. L. Mitchell, "	1 10
	55	Henry Fralick, "	3 50
	56	A. O. Hyde, "	1 86
	57	C. A. Harrison, "	5 80
	58	M. Shoemaker, "	2 70
	59	E. W. Rising, "	5 00
	60	I. H. Butterfield, "	5 10
	61	Philo Parsons, "	3 40
	62	A. F. Wood, "	85
	63	W. H. Cobb, "	3 80
	64	Wm. Chamberlain, "	8 60
	65	J. Q. A. Burrington, "	6 60
	66	John Lessiter, "	6 50
	67	D. W. Howard, "	13 40
	68	H. O. Hanford, "	4 95
	69	F. V. Smith, "	1 00
	70	Chas. Pinkney, carriage for committee	20 00
	71	Hudson House, board of committee	52 23
Jan. 25,	29	C. A. Harrison, expenses meeting 1881	9 85
Nov. 22,	270	A. J. Dean, expenses	8 90
	294	J. C. Sterling, "	7 52
		Total	$193 96

LOCATING COMMITTEE.

April 3,	41	Hurd House, board of committee	$10 50
June 7,	44	Russell House, board of committee	3 75
	45	J. M. Sterling, personal expenses	2 45
Aug. 12,	83	Henry Fralick, expenses attending meeting	5 60
	87	John Gilbert, expenses to Detroit	2 75
	88	J. M. Sterling, expenses	7 80
Nov. 22,	269	A. J. Dean, expenses attending meeting	5 35
		Total	$38 20

HORTICULTURAL SOCIETY.

May 20,	42	S. M. Pearsall, treasurer, first installment	$300 00
Sept. 22,	120	Hort. Society, expenses of society	500 00
Dec. 15,	317	S. M. Pearsall, treasurer, balance due	600 00
		Total	$1,400 00

EXPRESS.

Mar. 16,	37	U. S. Express Co., sundry charges	$3 80
June 7,	49	U. S. Express Co., sundry charges	6 38
Aug. 28,	100	Am. Ex. Co., on cambric from Chicago	1 25
Nov. 22,	288	Am. Express Co., sundry bills	29 89
		Total	$41 32

HERD BOOKS.

1882.	*Order No.*		
Mar. 16,	39	L. F. Allen, vols. 20 and 21 Short-horn Register	$15 65
	40	Am. Jersey C. C. vol. 7 Jersey Herd Register	3 75
Nov. 22,	282	L. F. Allen, vol. 22 Short-horn Register	6 00
Dec. 27,	321	L. F. Allen, vol. 23 Short-horn Register	5 00
		Total	$30 40

STATIONERY.

June 7,	43	F. D. Hamilton, envelopes, etc., for committee	$24 85
Nov. 22,	281	Fred W. Meyers, stationery for secretary's office	8 18
	283	Brown & Pilcher, stationery for secretary's office	6 11
Dec. 8	316	Isaac Lewis, stationery for secretary's office	9 94
		Total	$49 08

PREMIUM.

Jan. 12,	1	Mich. Carbon Works, premium money returned	$40 00

HOTELS AND BOARD.

Aug. 12,	91	Hibbard House, board Business Committee	$2 50
Oct. 3,	159	Hibbard House, board committee	11 50
11,	174	Hurd House, board com.	12 50
Nov. 22,	250	“ “	5 00
		Total	$31 50

FREIGHT.

Aug. 12,	95	M. C. R. R., one car lumber	$12 00
31,	109	“ “ ground pine	6 99
Sept. 22,	114	“ “ lumber	40 82
	115	“ “ sundry bills	2 11
Oct. 3,	166	“ “ “ “	1 19
Nov. 22,	309	“ “ car tools to Ypsilanti	10 00
		Total	$73 11

DECORATING.

Aug. 12,	93	Follmore & Scoville, lumber for centre piece	$3 50
	94	Parsons Bros., lumber for centre-piece	10 39
28,	97	Marshall, Field & Co, 600 yards cambric	35 35
Sept. 22,	117	Marshall, Field & Co., 300 yards cambric	22 60
	121	Tuomey Bros., 3 pieces mosquito bar	1 20
	122	G. O. Knapp, cutting and hauling evergreens	3 00
	124	Pay roll, winding evergr'ns and material	77 21
30,	145	Mrs. S. Holden, sewing cambric	18 00
Oct. 11,	176	Brown & Pilcher, 32 rolls paper	6 40
Nov. 22,	178	Chas. Root & Co., paper cambric	3 22
	305	John Gilbert, centre-piece main hall	5 00
		Total	$185 87

MUSIC.

Sept. 22.	126	M. C. R. R., fare for band	$13 15
	134	Band during fair	70 00
		Total	$83 15

POWER.

1882.	*Order No.*		
Oct. 3,	149	McKinstry & Wilson, fuel	$14 38
	161	Mich. Mfg. Co., engines for implement dept	80 00
		Total	$94 38

CHARIOT.

Oct. 3,	147	Elliot & Mowry, feed for horses	$16 20
Nov. 22,	203	Fargo & Mitchell, chariots during fair	500 00
		Total	$516 20

PRESIDENT'S LUNCH ROOM.

Sept. 22,	129	Jackson City Ice Co., ice	$3 00
	137	H. R. Kingman, milk	2 60
27,	142	Pay roll, help in lunch room	61 93
Oct. 3,	146	P. Fisher, baker's bill	16 30
	148	T. E. Howard, oysters	2 00
	154	E. M. Evans, fresh meat	14 14
	164	M. W. Robinson, towels, etc	10 60
	165	Hull Bros,, groceries	67 47
11,	177	Hammond, Standish & Co., hams	42 30
Nov. 22,	239	W. H. Cobb, butter	13 21
		Total	$233 55

MEAL TICKETS.

Sept. 22,	132	First Baptist Church, 216 tickets	$71 99
	136	F. Malaney, 10 tickets	3 33
	138	First Baptist, Napoleon, 9 tickets	3 00
	139	Methodist, Jackson, 83 tickets	27 66
	141	Methodist, Napoleon, 50 tickets	16 67
30,	144	W. S. Chandler, 143 tickets	47 66
Oct. 3,	150	Moses Forsh, 4 tickets	1 33
	151	Smith & Miller, 9 tickets	3 00
24,	195	S. N. Palmer, 12 tickets	4 00
Nov. 22,	306	Th. Buyse, 8 tickets	2 67
		Total	$181 31

POLICE.

Nov. 22,	199	Police pay roll	$264 50
	276	Hurd House, board sup't	18 00
	302	J. M. Sterling, superintendent's expenses	4 60
		Total	$287 10

FORAGE.

Nov. 22,	201	Fred Lewis, hay and straw	$540 28
	202	Frank Maynard, “	411 85
	234	E. W. Rising, “	80 00
	235	E. W. Rising, superintendent's expenses	25 50
	236	E. W. Rising, superintendent's expenses	17 00
		Total	$1,074 63

GATES AND GATE KEEPERS.

Nov. 22,	211	Mary Perry, board of men	$4 50
	214	Wm. Ball, supt's expenses	6 40
	227	Mrs. M. E. Evans, board of men	16 00
	229	Mrs. Oxtoby, board of men	50 00
	250	Hurd House, board of supt	8 50
	254	Mrs. Wm. Sexton, board of men	7 50
	256	V. W. Rising, attending gates	6 00
	264	Pay roll of gate keepers	153 50
		Total	$252 40

MEDALS AND DIPLOMAS.

1882.	*Order No.*		
Nov. 22,	312	Mayhew Business College, 9 diplomas	$2 25
31,	315	Calvert Lithograph Co., 75 diplomas	13 50
Dec. 20,	318	U. S. Mint, 3 silver medals	15 50
		Total	$31 25

BADGES.

Nov. 22,	247	Newcomb, Endicott & Co., ribbon	$3 37
	248	Allan Shelden & Co., ribbon	22 20
		Total	$25 57

BILL POSTING.

Nov. 22,	265	Chas Vanastrand, posting Adrian	$1 25
	296	G. W. Stevenson, posting Jackson	3 32
	297	G. W. Bowlsby, posting Monroe	1 60
	298	H. C. Wilmot, posting Ann Arbor	1 75
	299	Goodwin & Henry, posting Detroit	6 60
	300	G. W. Bills, posting Toledo	3 60
	301	W. R. Solomon, posting Kalamazoo	2 40
		Total	$20 52

TRANSPORTATION COMMITTEE.

Nov. 22,	260	Morris Knapp, livery for chairman	$14 00

BUSINESS COMMITTEE.

Nov. 22,	205	A. O. Hyde, expenses as member	$7 80

HORSE DEPARTMENT.

Aug. 12,	84	Charles Durand, use of stables at fair, 1881	$15 00
Nov. 22,	232	Morris Knapp, livery for department	28 50
	242	Pay roll, horse department	74 85
	252	Hibbard House, board for superintendent and help	117 50
		Total	$235 85

SWINE DEPARTMENT.

June 7,	73	Geo. D. Boyce, judge Division D, 1881	$12 75
Nov. 22,	209	John Lessiter, superintendent's expenses	10 20
		Total	$22 95

POULTRY DEPARTMENT.

Nov. 22,	274	S. W. Curtis, superintendent's expenses	$20 00

BEE DEPARTMENT.

Nov. 22,	313	Hibbard House, board of superintendent	$12 00

MARSHAL'S DEPARTMENT.

Nov. 22,	204	Marshal's department, expenses of department	$99 88
	244	Hibard House, board of superintendent and help	65 00
		Total	$164 88

MANUFACTURERS' DEPARTMENT.

1882.	*Order No.*		
Nov. 22,	208	F. V. Smith, superintendent's expenses	$11 94
	313	Hibbard House, superintendent's board	13 25
	313	Hibbard House, assistant's board	10 75
		Total	$35 94

CATTLE DEPARTMENT.

Nov. 22,	210	F. Hart Smith, judge in department	$2 50
	212	E. M. Cady, judge in department	9 00
	213	Louis Brush, judge in department	33 00
	221	I. H. Butterfield, supt's expenses	12 00
	313	Hibbard House, supt's board	19 50
		Total	$76 00

ART DEPARTMENT.

Nov. 22,	224	C. A. Harrison, supt's expenses	$7 75
	230	A. J. Brow, expenses Gale collection	109 30
	279	E. A. Davison, labor	4 00
		Total	$121 05

SHEEP DEPARTMENT.

Nov. 22	215	D. W. Howard, supt's expenses	$15 40
	313	Hibbard House, supt's board	20 00
		Total	$35 40

MISCELLANEOUS DEPARTMENT.

Nov. 22,	216	A. F. Wood, superintendent's expenses	$2 85
	313	Hibbard House, supt's board	19 50
		Total	$22 35

IMPLEMENT DEPARTMENT.

Nov. 22,	217	H. O. Hanford, Supt's expenses	$18 50
	219	Abel Angel, Supt's expenses	7 05
	250	Hurd House, Supt's board	16 00
	313	Hibbard House, H. O. Hanford's board	15 75
		Total	$57 30

MACHINERY DEPARTMENT.

Nov. 22,	218	Wm. Chamberlain, Supt's expenses	$10 80
	250	Hurd House, Supt's board	15 55
		Total	$26 35

CARRIAGE DEPARTMENT.

Nov. 22,	220	J. Q. A. Burrington, Supt's expenses	$8 50
	313	Hibbard House, Supt's board	24 50
		Total	$33 00

DAIRY DEPARTMENT.

Nov. 22,	222	F. L. Reed, Supt's expenses	$9 00

MUSIC DEPARTMENT.

1882.	*Order No.*		
Nov. 22,	223	M. P. Anderson, Supt's expenses	$24 10

AGRICULTURAL DEPARTMENT.

Nov. 22,	225	J. L. Mitchell, Supt's expenses	$10 50

CHILDRENS' DEPARTMENT.

Nov. 22,	231	Miss Minnie H. Brow, Supt's expenses	$37 80
	253	Hibbard House, board of assistant	9 50
		Total	$47 30

SUMMARY STATEMENT.

Expenses winter meeting	$632 32
President's office	34 25
Treasurer's office	672 45
Secretary's office	1,327 88
General expenses	531 59
Printing and advertising	928 05
Postage	109 00
Building, repair and labor on grounds	1,267 94
Lumber	217 06
Lansing Meeting	193 96
Locating committee	38 20
Horticultural Society	1,400 00
Express	41 32
Herd books	30 40
Stationery	49 08
Premium	40 00
Hotels and board	31 50
Freight	73 11
Decorating	185 87
Music (band)	83 15
Power	94 38
Chariot	516 20
President's lunch room	233 55
Meal tickets	181 31
Police	287 10
Forage	1,074 63
Gates and gate keepers	252 40
Medals and diplomas	31 25
Badges	25 57
Bill posting	20 52
Transportation committee	14 00
Business Committee	7 80
Horse department	235 85
Swine department	22 95
Poultry department	20 00
Bee department	12 00
Marshal's department	164 88
Manufacturers' department	35 94
Cattle department	76 00
Art department	121 05
Sheep department	35 40
Miscellaneous department	22 35
Implement department	57 30
Machinery department	26 35
Carriage department	33 00
Dairy department	9 00
Music department	24 10
Agricultural department	10 50
Children's department	47 30
Total	$11,579 81

Money Received by Business Committee and Paid to Treasurer.

BOOTH LEASES,

1882.	*Lease No.*		
Aug. 12,	1	Harmon Reede	$48 00
	2	M. A. Laughlin	42 00
19,	3	John Cullinene	42 00
	4	C. E. Berry	45 00
	5	Smith & Miller	72 00
	6	Blair & Moore	48 00
26,	7	Theophilus Buyse	90 00
Sept. 2,	8	F. A. Dolan & Co	$30 00
	9	C. F. Frey	78 00
	10	Bion Huntley	27 00
	11	George P. Updike & Co	30 00
	12	M. E. Church, Napoleon	78 00
6,	13	A. G. Bishop	12 00
	14	A. P. Bail	20 00
	15	Moses Forsh	72 00
	16	Carroll & Free	60 00
	17	F. J. Lewis & Co	54 00
	18	David DeMay	51 00
	19	Thomas Mills	48 00
	20	Robert Durham	30 00
	21	Daniel Osborne	30 00
	22	W. S. Chandler	60 00
	23	Father Malaney	60 00
	24	T. E. Howard	30 00
	25	H. R. Smith & Co	40 00
	26	Henry E. Beard	60 00
9,	27	John A. Meyers & Co	12 00
11,	28	Baptist Church, Napoleon	54 00
12,	29	J. W. Holmes	20 00
	30	E. H. Hickman	60 00
13,	31	N. H. Eckler	60 00
15,	32	Allen Moon	24 00
	33	William Johnson & Co	30 00
	34	Jerome Thompson	48 00
	35	J. W. Harper	12 00
	36	Johnson Barkman	50 00
	37	George Deyo & Co	24 00
16,	38	George W. Donaldson	100 00
	39	Peter Higgins	24 00
	40	J. E. Day	26 00
	41	Methodist Church, Jackson	120 00
	42	Ladies of Baptist Church	150 00
	43	M. E. Bartlett	15 00
Sept. 16,	44	D. M. Dearing	15 00
	45	Z. Hetfield & Co	10 00
	16	George B. Shetterly	25 00
	47	F. E. Calkins	12 00
18,	47	G. H. King	10 00
	48	Dan Sullivan	33 00
	49	R. Stanton	12 00
	50	Ostag & Olinger	19 00
	51	Albert Boeber	10 00
	52	F. N. Smith	15 00
	53	J. H. Hunt	7 50
	54	C. H. King	15 00
	55	Simonson & Kihlear	10 00
	56	Eugene Brown	20 00
	57	John Nelson	13 00
	58	John Nelson	10 00
	59	A. J. Mead	8 00
	60	S. Z. Bathner	10 00
	61	D. W. Sanford	7 50
	62	John Tesman	14 00
	63	W. J. Torrens	25 00
	64	H. E. Downing	7 50
	65	A. P. Bail	10 00
	66	M. J. English	7 50
	67	J. C. Ward	7 50
	68	Lyons & Maguire	20 00
	69	F. Barkwecht	25 00
	70	J. E. Tripp & Co	15 00
	71	L. D. Sidebottom	7 50
	72	C. C. Winslow	9 00
	73	T. S. Berry	15 00
	74	Charles Thatcher	10 00
	75	C. G. Hampton	15 00
	76	J. A. Tamvaco	5 00
	77	S. Anson	7 50
	78	Andrew Miller	25 00
	79	Mrs. L. Brooks	10 00
	80	George Howe	9 00
	81	Wood & Saraw	30 00
	82	Shemeld & Cook	30 00
	83	George W. Hall	110 00
	84	Louie Brown	13 00
	85	Abrams Bros	20 00
	86	H. R. Bryman	25 00
	87	J. Cridel	10 00
	88	J. Cridel	5 00
	89	A. Samuel	10 00
19,	90	F. Shedel	10 00
	91	Ehle & Davis	30 00

1882.	*Lease No.*		
Sept, 19,	92	August Bier	$25 00
	93	N. Sorres	10 00
	94	Doc. J. Snyder	36 00
	95	O. Packard	12 00
	96	Samuel West	5 00
	97	Slough & Gyse	30 00
	98	F. Roe & Co	15 00
	99	R. H. Hawley	15 00
	100	M. Russo	5 00
	101	Wm. Radcliffe	10 00
	102	R. A. Harris	12 00
	103	Carpenter & Amsden	12 00
	104	Martin Fox	10 00
	105	C. M. Rawson & Co	12 00
	106	W. J. Decker	5 00
	107	John Neppomuk	5 00
	108	Joe M. Tuttle	10 00
	109	Hickman Bros	48 00
	110	M. Fleichman & Co	5 00
	111	Wm. Lorenger & Co	5 00
	112	Ben. Marks	3 00
	113	Ben. Betson	10 00
	114	Thomas Pine	5 00
	115	Thomas Davis	5 00
	116	Foster & Anderson	12 00
	117	M. Morton	8 00
	118	Douglass & Stevens	18 00
	119	Isaac N. Stone	2 00
	120	A. F. Epstin	2 00
	121	A. A. King	15 00
20.	122	C. McMillan	5 00
	123	B. Poulson	10 00
	124	Mrs. B. Kelleman	7 50
	125	Phil Kantz	7 50
	126	E. G. Riley	7 50
	127	Howard & Baker	10 00
	128	W. C. Harbin	12 00
	129	Dr. McClellan	5 00
	130	Porter & Wells	8 00
	131	L. D. Canfield	15 00
	132	B. G. Gregory	5 00
	133	Ed White	5 00
	134	Robert Davis	3 00
	135	H. Childs	5 00
	136	Oslag & Olinger	6 00
	137	H. Gosser	5 00
	138	A. E. Vernett	10 00
	139	Godlieb Frey	60 00
	140	E. C. Ariba	36 00
	141	W. M. Morley	8 00
21.	142	H. L. Chapin	3 50
	143	C. E. Forrester	2 50
	144	E. Felter	20 00
	145	E. W. Wiggins	100 00
	146	W. J. Torrens	10 00
	147	S. E. Douglass	10 00
	148	Charles Fowler	3 00
	149	M. P. Schenck	15 00
	150	J. M. Myers	5 00
Total amount rec'd for booth leases			$3,652 00

MONEY PAID TREASURER BY BUSINESS COMMITTEE.

Total amount rec'd from booth leases	$3,652 00
Received from use of Detroit grounds as pasture	50 00
Received from sale of mower, etc., to Mr. Wakefield	40 00
Received from check room	54 20
Received from articles sold,—butter, hams, etc.	16 55
Total amount paid Treas	$3,812 75

INVENTORY OF PROPERTY BELONGING TO THE SOCIETY IN THE CITY OF JACKSON.

1 wagon shed, 24 x 100.
1 speaker's stand, 20 x 20.
1 press building, 18 x 24.
1 express office, 14 x 20.
1 Business Committee's office, 12 x 16.
1 Marshal's barn, 24 x 48.
1 Check room, 12 x 16.
1 Implement shed, 50 x 100.
1 Cattle amphitheatre, 50 x 100.
1 Well shed, 14 x 14.
160 Single horse stalls, 5 ft. 4 in. x 14.
25 Box horse stalls.
138 Single cattle stalls, 5 ft. 4 x 14.
20 Bull stalls.
178 Sheep and swine pens.
1,716 feet ¾-inch water pipe.
1,062 feet 1-inch water pipe.
321 feet ½-inch water pipe.
12 Elbows, 18 stop cocks.
4 ½-inch elbows.
3 Oil cans.
3 Bedsteads, old.
219 Feed troughs.
14 Lamp posts, 1 flag pole.
1 Straight edge.
1 Box checks (baggage).
28 Brass water faucets.
1 Dozen tin cups.
12 Water pails.
6 Common chairs.
1 Dust brush.
1 Looking-glass; 8 pillows.
12 Mattresses; 25 comfortables.
1 Lot mosquito netting, red.
1 Lot mosquito netting, white.
1 Lot mosquito netting, blue.
1 Piece mourning goods.
30 Signs.
1 Ship flag; 2 national flags.
1 Pomological flag.
1 Floral hall flag.
20 Department flags.
6 Wash tubs, 1 grindstone.
Rubber hose and cart.
2 Hay forks, 1 post auger.
2 Iron rakes, 1 scythe and snath.
2 Wooden rakes, 1 snow shovel.
1 Set blocks and tackle.
2 Straw fork, 1 grub hoe.
1 Ax, 1 round pointed shovel,
1 Old cook stove, zinc and pipe.
1 Old stove.
12 Brooms, 2 coffee boilers.
2 Dish pans, 3 dripping pans.
2 Tin pails, 3 teapots.
12 Lamps, 10 lanterns.
3 Oil cans, 1 hand saw.
1 Square, 2 sprinkling pots.
Stencils and outfit, 2 tables.
1 Spirit level, 1 tack hammer.
1 Hammer, 2 hatchets, 1 wrench.
1 Lot sash, 3 pieces table linen.
3 Rolls paper trimming.
70 Feet rubber belting.
2 Spades, 2 iron bars, 1 work bench.
1 Smoke stack and front.
1 Lot chicken feed boxes.
30 Pieces shafting and couplings.
3 Fish aquariums.
1 Lot table spoons.
1 Lot dozen tea spoons.
1 Lot knives and forks.
1 Carving knife and fork.
4 Round tanks.
11 Tank troughs.
45 Shaft horses.
75 Feed boxes.
5 Band wheels.
7 Tables.
1 Wheelbarrow.
1 Box miscellaneous.

1 Lot locks and keys.
1 Pigeon hole box.
1 Iron kettle.
10 Ticket boxes.
2 Broken boxes glass.
1 Bundle small rope.
1 Scoop shovel, 1 hoe.
1 Log chain.
4 Jugs.
1 Centre piece for Main Hall.
1 000 Yards cambric for decorating.
1 Bushel basket.
1 Lot ball valves.
1 Lumber wagon and sprinkler.
1 Field roll.
1 Track scraper.

PROPERTY IN THE CITY OF DETROIT.

1 Main Hall.
1 Octagon fruit hall.
1 Grand stand.
1 Railroad freight house and platform.

All of which is respectfully submitted,

JOHN GILBERT,
WM. H. COBB.
A. O. HYDE.

Mr. I. H. Butterfield, Jr., Superintendent of Division A, Cattle, submitted his report, as follows:

DIVISION A—CATTLE.

The following report of the exhibition of cattle at the Annual Fair of 1882, is respectfully presented. The total number of entries was 500, which were nearly all exhibited. The number of entries in the several classes were as follows: Class 1, 113; Class 2, 39; Class 3, 6 entries, which were not exhibited, while Mr. David Clark, of Lapeer, had his cattle on exhibition, but his application for entries was received too late. Class 4, 39; Class 5, 80; Class 6, 24; Class 7, 90; making a total of 390 head of pure bred cattle, and of uniformly good quality. Of grades, there were 41; working oxen and steers 10; fat cattle, 17. Herds, 34; also a herd of pure-bred Guernseys. The pure-bred cattle stand this year as to numbers: Shorthorns, 1st; Holsteins, 2d; Jerseys, 3d; with the others in much smaller numbers.

The amount of premiums awarded was $2,924.50, or $111.50 less than in 1881. This decrease was owing to the non-exhibit of Herefords. A herd of Ayrshires from Pennsylvania, and one from Ohio, and a herd of Holsteins or Dutch Frieseans, from New York, constituted the exhibit from out of the State.

The sickness and death of some of the cattle from abroad, the particulars of which I am not as yet fully informed, has led some of the cattle breeders to feel that it is not entirely safe to allow a promiscuous exhibit from all parts of the country. I have no recommendation to make on this matter, but submit it to the Board as a matter which should receive careful attention.

I renew my former recommendation of the publication of a catalogue of the stock on exhibition, and think it worth a trial by the Society.

At the last fair I tried an experiment of having a single expert judge in the class of Jerseys, with entire satisfaction to myself, and I am assured to the exhibitors also.

As the Society will probably erect new stalls for the next Fair, I suggest that they be arranged in a more concentrated form, and with reference to convenience to the show ring. The practice of building the stalls in long rows adjoining the outside fence, though a saving of lumber, is inconvenient to exhibitors and visitors, and desirable in no other respect.

It would add to the value of the awards of committees, if the reasons for their decisions were also taken and published with the awards. Concisely stated, they would not make a burdensome report, and it would afford instruction to exhibitors, and be some protection against unfair awards.

At the request of several breeders, and with a belief that it is desirable, I recommend that the former premiums for "Bull and his get," and "Cow and her progeny," be restored as being in the line of encouragement for breeding stock.

The breeders of Holsteins, Jerseys, etc., demand the same herd premiums as are awarded to Shorthorns. I recommend the continuance and increase of premiums on fat cattle, as desirable in every respect. Also that in the pure-bred classes of cattle classed as dairy-breeds, exhibitors of cows be allowed to furnish to the Committee a statement of milk and butter product, properly verified.

In view of the great and increasing value of the dairy product, it is desirable that the Society soon establish a class in which quantity, quality and cost of dairy product shall determine the award. The best may and probably will be found in the line of pure-bred stock, but performance is the test for profit, and the real, true end to be sought in cattle breeding, and which agricultural societies should encourage.

I think it entirely proper that this Board take some action in reference to the suppression of contagious diseases among cattle. It would seem by the delay of Congress to act, that it is necessary to keep the question before the people till our legislatures shall be forced to do something for the protection of the cattle interest.

I. H. BUTTERFIELD, JR.,
Superintendent Cattle.

Report accepted and referred to Committee on Premium List.

Mr. W. H. Cobb, Superintendent of Horses, Division B, reported as follows:

DIVISION B—HORSES.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Superintendent of Division B, would respectfully submit the following report:

The entries Class 12, Thoroughbreds, were 89; in Class 13, Horses of all work, 114; in Class 14, Roadsters, 47; in Class 15, Breeders' Stock, 72; in Class 16, Gents' Driving Horses, to Road Wagon, 32; in Class 17, Draught Horses, 40; in Class 18, Carriage and Buggy Horses (geldings or mares), 35; in Class 19, Premium for Michigan Horses, Roadsters and Thoroughbreds, 25; in Class 20, Premium for Michigan Horses, Mares, and Geldings, 53; in Class 20½, Michigan Horses (thoroughbred stallions, mares and geldings), 14; in Class 21, Sweepstakes, for Stallions with six Colts of his own get, 11; making a total of 532 entries. A large proportion of the horses entered were very fine ones and was an honor to the exhibitors. The amount of premiums awarded in this department was $2,829; the amount of the premium list, was $3,573. As far as the Superintendent was able to learn, the exhibitors were well satisfied with the amount of premiums awarded in each class, and all were satisfied except in two instances, where protests were made, which will be reported upon in their order of business.

There are many things pertaining to the Horse Department that cannot be understood except by actual experience. Where so many exhibitors come together, all anxious to get first premium, some are sure to be disappointed. Every one cannot get the stalls they want, or the stalls are not so large as they would like; but the Superintendent is expected to widen or lengthen the stalls to suit each exhibitor (which is generally done). The grounds were in the usual good order; also the track.

The Superindent wishes to thank the gentlemen who acted as judges at the last Fair for their patient and careful labor; knowing them to be well qualified to discharge the duties involved upon them. The difficulty in obtaining thoroughly competent men to serve on these Committees is yearly becoming more difficult. Very few competent persons are willing to give their time for a whole week without pay.

The Superintendent has no changes to recommend in the premium list.

All of which is respectfully submitted.

W. H. COBB,
Superintendent.

Report, on motion, accepted, and referred to the committee on premiums.

It was voted that all reports of superintendents of departments be referred to Committee on Premiums, without further action.

Mr. D. W. Howard, Superintendent of Sheep, Division C, reported as follows:

DIVISION C—SHEEP.

To the President and Executive Committee of the State Agricultural Society:

I respectfully present report of the exhibition in Division C, at the Annual Fair of 1882:

The total number of entries in this division was 503. The exhibit was above the average, both in numbers and quality, and was creditable to the sheep breeders of the State.

The total premiums offered in this division were $1,184; amount awarded was $1,152, as follows:

Class 22, entries 208, premiums offered $349, awarded $349; Class 23, entries 27, premiums offered $91, awarded $86; Class 24, entries 35, premiums offered $152, awarded $152; Class 25, entries 101, premiums offered $152, awarded $152; Class 26, entries 34, premiums offered $152, awarded, $147; Class 27, entries 51, premiums offered $152, awarded $152; Class 28, entries 15, premiums offered $61, awarded $44; Class 29, entries 17, premiums offered $75, awarded $70.

There were fifteen entries for a special premium of a silver water pitcher, valued at $20, offered by the Prairie Farmer Publishing Co., Chicago, for the best thoroughbred American Merino ram and two ewes. Award given to Mr. Wm. Ball, Hamburgh, Mich.

As there is a large competition in Class 22, American Merino, I would recommend a fourth premium on all entries in that class.

Respectfully submitted,

D. W. HOWARD,
Superintendent.

Accepted and referred.

Mr. John Lessiter read the following report for Division D, which was accepted and referred:

DIVISION D—SWINE.

To the President and Executive Committee of the Michigan State Agricultural Society:

The total number of entries in this division was 248, last year 170. The number of entries in each class was as follows: Berkshires, 52; Essex, 50; Suffolk and Small Yorkshire, 67; Poland China, 41; Chester White, and Large Yorkshire, 29; fat hogs, 9. Total amount of awards in this division $656. The exhibits were above the average in quality as well as numbers, and were creditable to the swine breeders of this State.

Would ask for this division more pens, if found after the entries close that the entries exceed the number of pens, as was the case at our last exhibition—as some of the entries had to be viewed in the crates they were brought in—after asking the exhibitors to put two or more entries in one pen.

All of which is respectfully submitted.

JOHN LESSITER,
Superintendent.

The report of Acting Superintendent W. S. Curtis was read, accepted and referred.

DIVISION E—POULTRY.

To the President and Executive Committee of the State Agricultural Society:

In Division E, poultry, there were 420 entries and about 50 pair were too late to enter. The exhibit was larger than ever before, and larger than the accommodations provided for them. There were some in every class that were very good, but a good many of them were inferior. I think that the premium for the best, most varied and valuable collection is the cause of the large showing of inferior fowls. I would recommend striking from the list in Game Class, blue games, black games, and white-legged Earl Derby games, and inserting pile games. In Bantam Class I would strike out white bantams. I would change from brown Hamburgs to golden penciled Hamburgs, the correct name for them. I would also insert langshangs in the Asiatic class. Very respectfully, S. W. CURTISS,
Acting Superintendent.

Mr. A. F. Wood, Superintendent of Miscellaneous Department, read his report, as follows:

DIVISION P—MISCELLANEOUS.

To the President and Executive Committee of the State Agricultural Society:

Division P, miscellaneous, consisted of Classes 63 and 64, and as is expected, many unenumerated articles. There were 55 prizes offered, 64 entries in all, and $41 and two diplomas awarded. There was but little on exhibition among the enumerated articles in Class 63. I hardly think it practical to offer the same prizes longer as they are. There has not been any creditable show in many things for the past two years.

In Class 64 most of the articles were on exhibition, and in washing machines and wringers there was a very creditable display, and it is my opinion that the small premium offered should be struck out, and let them show the same as other machinery. We would get just as good a show, and give better satisfaction. Refrigerators were on exhibition that had every appearance of being useful, and as the premiums offered did not seem suitable, a diploma was awarded.

Respectfully submitted,

AMOS F. WOOD,
Superintendent.

Accepted and referred.

The secretary read the report of Superintendent Miss Minnie H. Brow, Divisions O and Q, as follows:

DIVISIONS O AND Q.

Gentlemen of the Michigan State Agricultural Society:

The time for annual reports comes again, and I would respectfully submit the following: The display of articles in my department at the last fair was very large and full. The several classes were well represented, and the quality of work far above the average. Very much to my gratification, I was given a much larger space in which to make the display, and numerous expressions of approval were heard from the exhibitors. There were very few complaints made, excepting in regard to the dust arising from the sawdust which served as the carpet; and in all truth I would say that the idea of sawdust on the floor over which hangs the finest kind of handwork, and a well constructed board floor underneath machinery and wire goods, does seem a little incongruous. In order to save some dissatisfaction and complaint, I would respectfully suggest that, if possible, the floor at the coming fair may be covered with rough boards, if nothing better.

The Children's Department was quite full, and a growing interest is seen in this division every year. It would seem a good idea to me to make out a premium list for the coming fair, so that the children may have something definite to work for. In the awarding of premiums the committees exercised unusual discretion, and the comparatively small amount expended—$243.25—seems sufficient proof of their care in this regard. I have taken the liberty of offering for your inspection a revised premium list, as the new styles of work constantly appearing make a frequent change necessary. In closing my report, I would thank the gentlemen for all favors shown to myself and Miss Sterling, who so kindly assisted me, and trust that my duties have been performed to your satisfaction.

Very respectfully,

MINNIE H. BROW.

It was moved by Mr. Baxter that so much of the report as refers to making out a new premium list for Children's Department, be referred to Miss Brow and the secretary. Carried.

Balance of report accepted and referred.

Mr. Wm. Chamberlain, Superintendent of Division K, asked for and was granted further time to report.

Mr. J. Q. A. Burrington, Superintendent of Division J, vehicles, submitted the following, which was accepted and referred.

DIVISION J—VEHICLES.

To the President and Executive Committee of the Michigan State Agricultural Society:

In Division J, vehicles, at the last fair of this society, there were 148 entries. The amount of premiums offered by this society, in this division, was $215. The amount awarded by the committee, $191.

The exhibition in number and excellence of workmanship, excelled that at any former fair of this society, since I have had connection with it.

I would recommend that there be no money premiums offered the coming year in this division, and that a larger amount be expended for the accommodation of exhibitors, by furnishing them with more covered space for their exhibits than has heretofore been done, and that the diploma of the society be offered for the best display of light work in this department, and the same for heavy work.

All of which is respectfull submitted.

J. Q. A. BURRINGTON,
Superintendent,

Mr. F. Smith, Superintendent of Manufactures, Division L, reported as follows:

DIVISION L—MANUFACTURES.

To the President and Members of the Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN,—The number of entries in Class L, manufactured good, were 114.

The amount awarded was, cash, $221, and one diploma. Of this amount, the award on wool and flax was $72; woolen blankets, $5; articles of leather and rubber, $48; articles of furniture, $76; ornamental iron work, $20; total, $221.

Some changes in the list of premiums offered for wools—ten samples of each, fine, middle, and long, exhibited by one exhibitor—should be so altered as to require the ten samples to have been grown by the exhibitor.

The display in this department was very creditable, the room ample, and the exhibitors and visitors expressed much satisfaction.

F. SMITH,
Superintendent of Manufactured Goods.

Accepted and referred.

The report of Mr. J. L. Mitchell, Superintendent of Division F, Farm and Garden Products, was read as follows:

DIVISION F—FARM AND GARDEN PRODUCTS.

To the President and Members of the Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN—The exhibition in Division F, Farm and Garden Produce and Manufactured Products, while not as large as that of 1881, or as might have been desirable, it was still a fit representative of the productive soil of the State. The wet weather of the season preceding the fair while inducing a large vegetable growth, materially retarded the development and maturity of the vegetable products. The space allotted to the division was well filled, and in quality equaled any of its predecessors.

I would present the following synopsis of this division:

Class.	No. of Exhibitors.	No. of Entries.	Amount premiums offered.	Amount premiums awarded.
32	23	79	$253	$191
33	33	203	281	232
34	3	21	50	44
Total,	59	303	$584	$467

The show of potatoes was very fine and large, as was that of garden vegetables from the market gardens of C. M. Hubbard and Stephen Marks, of Detroit.

I was requested by exhibitors in Class 33 to call the attention of the Committee on Revision of the Premium List, to the large number (dozen) of articles enumerated on page 46 of the list, required to be shown. I would suggest that the number required to be shown be reduced to "six or more."

I would make another suggestion to the committee on "list," which comes from two years' experience in your society, and a number in our county society. In Class 33, "Roots and Vegetables," the professional gardener always sweeps the field in the way of display and premiums. So well is this understood by the farmer and general grower, that their entries are limited in this class. On asking the farmers—who are the large supporters of the society—why they do not exhibit more of their roots and vegetables, this reply comes from all: "It's of no use, the gardeners outshow us every time," which is true, and with the exception of potatoes and a few minor articles, at the last fair, this Class 33 was monopolized by two professional gardeners. While we want to give increased encouragement to the latter class, we should give some to the general grower. I would submit to the Committee on Revision of "List" the propriety of adding a sub-class 33, with ample provisions for professional gardeners, and to which their competition shall be limited."

My thanks are due to the president, secretary, and Business Committee for their assistance in this division during the fair, and I most heartily tender them.

Respectfully submitted,
JOHN L. MITCHELL,
Ex-Superintendent Division F.

JACKSON, Dec. 30, 1882.

Accepted and referred.

Mr. W. J. Baxter, Superintendent Division H, Bees, Honey, etc., submitted the following report, which was accepted and referred:

DIVISION II—CLASS 38—BEES AND HONEY.

For the first time at an annual fair, separate provision was made for the display of bees and honey. The interest manifested and the display made were such as to show the wisdom of the experiment and justify its continuance.

The premiums offered were $115. The number of entries, 47. The premiums awarded amounted in the aggregate to $92.

The building was most of the time thronged with interested spectators, and much valuable information was imparted on the keeping and management of bees, securing perfect forms of comb honey for table use, and extracting honey for preservation use.

The premiums offered were small, insufficient in most cases to pay the actual expense of exhibitor, and yet there was a good exhibition and a generous rivalry.

Owing to the fact of my absence from the State for some time prior to the fair, judges had not been secured beforehand, and some difficulty was experienced in securing them. This can be remedied at our next fair. While there are some in the State who make bee culture and honey-raising a business, the number of such is comparatively small, but with a proper knowledge of the subject which may be easily secured, almost any one with even a garden patch can keep a few swarms, and add greatly to the comfort and luxury of his home.

There are several different races of bees, each claiming peculiar merit, and it would be well to encourage an exhibition of all these varieties by the offers of a sufficient premium for the largest and best display of different varieties of working bees, to secure exhibitors and competition.

Again, queen bees of different races, always attract attention. Their value is however too great to risk exhibition without the offer of a suitable premium. The exhibition of bees in observation hives should be encouraged, as well as the exhibition of hives for ordinary use.

It has been suggested by exhibitors that a premium of some value be offered for the best device for exhibiting bees, which would, of necessity, include the handling of them at the fair, and I heartily recommend the suggestion.

Some exhibitors have also suggested competitive essays on bee keeping, the best to be read at a stated time, at the exhibition building, would be a valuable feature. If this should be adopted, the essays must be required to be in the hands of the committee for examination as early as the 1st of September, that careful examination might be made, and the prize essay be handed over to a good reader, that it might be so read as to be heard, understood, and appreciated. The essays should be limited as to time, that well considered and condensed thought might be secured.

A committee from the Bee Keepers' Association will be present and make some suggestions to the Committee on Premium List, for whom I ask a favorable hearing. This committee will urge that the privilege of making sales of honey, bees, hives, etc., may be made from the stocks they bring daily, but not to the detriment of the exhibit. If this can consistently be done, it would secure a very large display, and a full attendance. I do not think it would be asking too much in consideration of the interest and growing importance of this industry to at least double the amount offered at the last fair, and provide a separate building for the exhibition.

Respectfully submitted,
W. J. BAXTER,
Superintendent.

Mr. E. W. Rising, Superintendent of Forage, was given further time to report.

Superintendents of Gates were granted further time to report.

Superintendents of Police were also granted further time to report.

It was voted, on motion of Mr. Sterling, that the sessions of this Committee open at 9 o'clock A. M., and continue until 6 P. M., with the usual intermission for dinner, and that no evening sessions be held until otherwise ordered.

Mr. Ball was excused from serving on the Committee on Farm Wagon protest.

The President appointed Mr. J. M. Sterling in his stead.

Mr. Gilbert was, on motion, excused from serving on the same committee, and Mr. A. O. Hyde was substituted.

On motion, the Committee adjourned until Tuesday morning at 9 o'clock.

SECOND DAY.

MICHIGAN EXCHANGE, DETROIT,
January 9th, 1883.

The Executive Committee met pursuant to adjournment. President Fralick in the chair.

Roll called. Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Butterfield, Gilbert, Anderson, Baxter and the Secretary.

Upon motion of Mr. Baxter, the reading of the minutes of last evening's session was dispensed with.

The President called for reports of superintendents.

Mr. Wm. Chamberlain presented the following:

DIVISION K—MACHINERY.

To the President and Executive Committee of the Michigan State Agricultural Society:

As Superintendent of Machinery Hall, Division K, Classes 46 and 47, I have to report a very meagre exhibit at our last Fair. The total of premiums offered in this division amounted to $415, with nine medals and one diploma. The entries made were fourteen. The premiums awarded were thirteen dollars cash and three medals. It is exceedingly mortifying to a superintendent to have a large hall under his charge and but little to attract visitors, and for a few years past this part of the Fair has been a failure. I cannot see that it is any fault on the part of the Society, as every opportunity is given in this class to exhibit their goods, and liberal premiums offered. There seems to be an indifference on the part of manufacturers in this line to patronize the State Fair. The excuse given is that they are driven with business and have no time to attend to the Fair, their orders for goods being now more than they can fill.

The large space in Machinery Hall at Jackson unoccupied by exhibitors in this class was cheerfully given to manufacturers of farm machinery, wagons, carriages and miscellaneous articles, and with the aid of these gentlemen, the hall was filled and made quite attractive to visitors. I do not think any increase of premiums necessary, and incline to the opinion that a better exhibit would be made if there were none offered.

All of which is respectfully submitted.

WM. CHAMBERLAIN,
Superintendent.

Accepted and referred.

Mr. F. L. Reed, Superintennent of Dairy Department, reported as follows:

DIVISION G—DAIRY DEPARTMENT.

To the President and Executive Board of the Michigan State Agricultural Society:

GENTLEMEN—In Division G, class 35, there were 68 entries; the amount of premiums awarded was $150; in class 36, there were 62 entries. The amount of premiums awarded to the same was 52. Total of amount, $201. Total entries, 130. There were some entries in this department which should have been in the miscellaneous and the room allotted was quite too small for the exhibit. The display of dairy fixtures from other States was worthy of especial notice, and attracted much attention from the dairymen of our State, and I think will be used by many of the smaller, as well as the larger dairies of Michigan. There was sharp competition in class 36, especially in bread making, and the judges were a little at a loss to know where to place the blue card.

Respectfully,

F. L. REED,
Superintendent.

Accepted and referred.

Mr. Wm. Ball reported for Superintendent of Gates, as follows:

GATES.

To the President of the State Agricultural Society:

The plan pursued by the committee on gates and gatekeepers, was similar to that in former years, the working of which was quite satisfactory. Through the kindness of President Fralick and Treasurer Dean, your committee are under obligations for their kindness in suggesting the names of competent men for gatekeepers, who performed their respective duties with fidelity and credit to themselves. The greatest difficulty in carrying out the rules governing the gate department was experienced in the use of attendants' tickets. Your committee would recommend that some plan be adopted as suggested by the President in his address, whereby every person who has a right to an attendant's ticket, should be obliged to enter the grounds at the same gate, and that no other tickets should be received there. And your committee would further recommend that every exhibitor and booth or stand men or women should make out a list of the names and numbers of the men or women under his or her control, necessary to aid him or her in their exhibition or business, and present it to the Superintendent of Gates, who shall give a copy of such list to the gatekeeper, with instructions to check each man's or woman's name for every entrance he or she may make upon the society's grounds during the fair. Your committee would suggest that more stringency be used in preventing so many assistants being allowed to come upon the grounds with the ostensible purpose of working in the eating houses or booths, but in too many instances to gain a free admittance to the fair.

All of which is respectfully submitted,

W. BALL,
Chairman.

On motion, the report was accepted and referred to the Committee on Rules.

Mr. M. P. Anderson, Superintendent of Division M, submitted the following report:

DIVISION M—MUSICAL AND SURGICAL INSTRUMENTS, ETC.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Superintendent in Division M would respectfully submit the following report:

The entries in class 54, sewing machines, musical instruments, etc., were 13. In class 55, clocks, jewelry, plated ware, etc., no entries were made.

The amount of premiums awarded in this department was $10.

Some confusion arose on the first day among the exhibitors on account of the absence of the superintendent, but all were finally located, and so far as I was able to learn were well satisfied.

The display of musical instruments and sewing machines was very fine. Booths were tastefully arranged, adding to and beautifying that portion of the hall occupied by them.

The display of sewing machines and musical instruments requiring considerable space, it is desirable that the superintendent should have a correct diagram of his department at as early a day as possible, that he may arrange the musical instruments in such a manner that their music will not interfere with each other.

It is desirable that the superintendent should be on the ground early, as they require time to arrange their space for exhibition.

M. P. ANDERSON,
Superintendent.

Accepted and referred.

The President appointed the following

STANDING COMMITTEES:

COMMITTEE ON TRANSPORTATION.

J. M. Sterling, W. L. Webber. W. J. Baxter.

COMMITTEE ON FINANCE.

William Ball, E. W. Rising, M. P. Anderson.

COMMITTEE ON PREMIUM LIST.

Wm. Ball. A. F. Wood. Wm. Chamberlain. W. H. Cobb.
I. H. Butterfield, Jr. H. O. Hanford. Jno. Lessiter.

COMMITTEE ON RULES.

C. A. Harrison, G. W. Phillips, J. Q. A. Burrington. J. M. Sterling.
A. F. Wood.

COMMITTEE ON RECEPTION.

P. Parsons, M. Shoemaker. W. G. Beckwith.

COMMITTEE ON PRINTING.

A. J. Dean, J. C. Sterling, John Lessiter.

The committee then took a recess until 2 o'clock.

AFTERNOON SESSION.

The Executive Committee resumed business at 2 P. M., President Fralick presiding.

Quorum present.

Mr. Cobb, to whom the protest entered against Mr. Ray Warner's gelding was referred, reported as follows:

The committee to whom the protest made against the horse entered by Ray Warner, and driven by J. C. Blake at the last State Fair, would report that they have made satisfactory examination in the case, and are thoroughly satisfied that the horse was entered for two premiums, in opposition to the rules of the Society, and that Mr. Ray Warner was notified on the ground that he had forfeited his premium by so doing, and he acknowledged to Mr. Vosburg (Chairman of the Committee of Judges in this class), that he was sorry, but could not blame the committee. Therefore, the committee recommend that the protest be sustained.

W. H. COBB,
Chairman Committee.

Report accepted and adopted.

Mr. Cobb, Chairman of the Committee on the protest of the Austin, Tomlinson & Webster Manufacturing Co., reported for that committee, as follows:

To the President and Executive Committee of the State Agricultural Society:

Your committee to whom was referred the protest of the Austin, Tomlinson & Webster Manufacturing Company, in Class 45, Division J, beg leave to report:

After hearing the statement made by the Superintendent in charge of the department and one member of the Viewing Committee, also of two disinterested persons, we recommend that the protest be sustained, for reason of personal prejudice of one member of the Viewing Committee, and that all acts of said committee relative to the award on farm wagons, be void.

W. H. COBB,
A. O. HYDE,
J. M. STERLING.

The report was, on motion, accepted and adopted.

Mr. E. W. Rising, Superintendent of Forage, reported as follows:

FORAGE DEPARTMENT.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Superintendent of Forage would report, that owing partly to the rise on hay, and partly to the large exhibition of stock, the expenses of the department were somewhat larger than those of last year, and which would seem to be unavoidable. In regard to the recommendation of the President, there seems to be two sides to the question. After careful consideration of the whole matter, your Superintendent is not able to say which way would be the best for the Society. Of course, the location has something to do with the results. If it is handled loose (as it was last year), the results, I think, would be best, but if baled, perhaps it might be the other way. I think it can only be determined by trial; it would be very convenient to have scales in either case.

There was a good feeling in my department the last year, everybody seemed to be satisfied.

E. W. RISING,
Superintendent.

Accepted and referred to Committee on Rules.

Mr. A. O. Hyde, Chief Marshal, submitted the following, which was accepted and referred to Committee on Rules.

MARSHAL'S DEPARTMENT.

To the President and Executive Committee of the Michigan State Agricultural Society:

MR. PRESIDENT AND GENTLEMEN—The Marshal's duty is not always pleasant. It is expected that he and his assistants will be at the service of everybody, and there all the time. This is all right. With the aid of a few volunteer policemen (fees $1.50 per day), whose greatest anxiety is to see the show and to keep watch of the man that is to furnish them with dinner tickets, on grounds located as the grounds are at Jackson, it is quite out of the question for a marshal to please himself or anybody else, the whole eastern side being open to the multitude constantly swaying forward and back, between the various halls and the implement department, making, in fact, a grand procession constantly crossing the track, composed of men, women, and children, baby-carts, dogs, etc. While this was the last year a marked feature on the eastern side, it was but little better at the highway kept open for the convenience of exhibitors at the northwest corner of the grounds. We were fortunate in getting along without accident, largely owing, we think, to the general good nature of the swaying multitudes. I would here suggest that in the future selection of a location for the State Fair, care should be taken to get grounds where exhibitions inside of race tracks should be excluded as far as practicable. I will only add that for any success we may have secured, I have largely to thank our ever-active and efficient Assistant-Marshals, Messrs. Hodge, Hinds and Erwin The programme was so arranged that no deviation was found necessary. Every day's work was accomplished as laid out, and in good, seasonable time.

Submitted. A. O. HYDE,
Marshal.

Mr. W. J. Baxter, Chairman of Committee on President's Address, reported as follows:

To the President and Executive Committee:

The Committee to whom the President's Address was referred for distribution of topics, to appropriate committees, would recommend reference as follows:

That so much as refers to general encouragement of agriculture in the State, to Machinery, to Northern Exhibit, to Fine Arts Exhibits, to Needle and Fancy Work and to Premium List, be referred to the Committee on Preminm List.

So much as refers to judges and awarding committees, be referred to Committee on Rules.

So much as refers to finance, to the Committee on Finance.

So much as refers to general policy of the society, as to prohibiting the sale of spirits, granting booth and show permits, be to the Committee on Rules, to the end, that if the rules on these matters are not already sufficiently explicit, they may be so amended or changed, that no officer or committee can misunderstand or fail to carry them out in their full intent and spirit.

So much as refers to admission to the fairs and to rules, to Committee on Rules.

So much as refers to sorghum, to Committee on Premium List.

So much as rerers to forage, to Committee on Rules.

So much as refers to bee culture, to Committee on Premium List.

So much as refers to inviting Horticultural Society to exhibit with us, and amount to be set aside to aid in such exhibition, be referred to a special committee of three, to confer with a committee from said society.

So much as refers to Agricultural College, to a special committee of three.

So much as refers to fair circuit, to a special committee of three, with authority to meet with like committees from other societies represented in such fair circuit.

So much as refers to location of the next fair, to Business and Transportation Committee, associated with the president, treasurer, and secretary.

So much as refer to securing several different places in the State, whenever suitable provisions may be made jointly by this society, and by local committees, for holding annual fairs, be referred to a special committee of five, to whom the president shall be chairman, with instructions to endeavor to secure propositions to select four or more places, and to submit propositions and recommendations to the society at its next winter meeting, to the end that definite action may then be taken.

Respectfully submitted,
W. J. BAXTER,
PHILO PARSONS,
F. V. SMITH,
Committee.

Report accepted and adopted.

Mr. Cobb, Committee on Baker protest, asked for further time to report, which was, on motion, granted.

Mr. Baxter asked to be excused from serving on Premium List Committee. On motion of Mr. Chamberlain, the request was granted, and Mr. A. F. Wood appointed a member of the committee.

The report of the Horticultural Lepartment was presented, and upon motion, accepted and referred.

The committee then adjourned.

THIRD DAY.

MICHIGAN EXCHANGE,
DETROIT, *Jan. 10, 1883.*

The Executive Committee resumed its session at 9 o'clock A. M., as per adjournment.

The roll was called, and the following named members found present: Mr. President Fralick, Mr. Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Anderson, Baxter, and the Secretary.

Mr. Parsons introduced Judge Maynard, Romeo, Mich., who addressed the committee, recommending the "Morton Reversible Tread Horse Power."

Mr. Parsons presented an invitation from Mr. Hiram Walker, asking the Executive Committee to visit his stables. Accepted with thanks.

The minutes of Tuesday's session were adopted as printed, without being read.

Mr. Parsons then read the report of the Superintendent of the Art Department, as follows:

ART DEPARTMENT.

To the President and Executive Committee of the State Agricultural Society:

GENTLEMEN,—The entire number of entries in Division N was 237; premiums offered, $465; premiums awarded, $301. The absence of the great collection of paintings which occupied so prominent a place in the art gallery of the fair of 1881, it was thought, would materially detract from the interest and value of the display in 1882, but such did not prove to be the fact. The increased number of productions by Michigan artists, in various forms, fully compensated for the lack of a distinctive show gallery. The entries for 1882 were more varied in their character, and of greater interest and artistic merit than ever before shown, and conclusively prove a rapidly growing taste throughout the entire State in this conspicuous evidence of advanced culture. No stronger proof could be adduced than this interesting display of varied art collections of the high character of culture and education in Michigan. Without special enumeration, decorations on china may be specially noted as forming a feature of added interest, and great improvement in this direction may be anticipated in the future. In view of the competition, which it seems so desirable to stimulate, we would respectfully suggest an increased number of premiums, and in some cases, of larger amounts. The premiums awarded in some instances, on most meritorious productions, hardly compensate for the attendant expenses and anxiety connected with their exhibits, while the constant crowd in the art hall during the fair afforded ample evidence that this interest should be earnestly fostered and encouraged by the utmost liberality.

Respectfully submitted,
C. A. HARRISON,
P. PARSONS.

Accepted and referred.

On motion of Mr. Gilbert, it was

Resolved, That the thanks of this society be tendered to the Atlas Engine Works, Indianapolis, Ind., for the fine engine they furnished free of cost to the society, for running the machinery in Mechanics' Hall, at our last fair at Jackson, and to their engineer in charge of same, for the gentlemanly and efficient manner in which he performed his duties.

The president appointed as committee on that part of the President's Address relating to the State Horticultural Society, Messrs. Parsons, Mitchell, and Burrington; on that part relating to the Agricultural College, Messrs. Baxter, Howard, and Reed; on that part relating to Fair Circuit, Messrs. Dean, J. M. Sterling, and Smith.

Mr. Baxter, Chairman of the Special Committee on so much of the President's Address relating to the Agricultural College, reported for that committee as follows:

To the Executive Committee of the Agricultural Society:

Your Special Committee to whom was referred so much of the President's Address as refers to the Agricultural College, would respectfully report that they entirely concur in the views expressed by the president, as to the value and importance of the work done by this institution, its eminently practical character, and the influence it is exerting upon the important industries it was designed to promote, in elevating the character and broadening the views of those engaged in farming, stock raising, and kindred pursuits.

Education, culture, and refinement belong to no class or condition, but should be found in all, and this college is doing much to strengthen and render general the conviction that education, culture, scientific knowledge, and refinement in thought and conduct, are of no less value to the farmer, the mechanic, and the artizan, than to the professional man.

It is eminently proper that this society should hold close and intimate relations with the Agricultural College, and that it should, by all suitable measures seek to win to the sympathy and support of the institution all who represent the varied industries of the State. They recommend that the invitation to meet at the college on the second Wednesday in June be accepted, and in order that the visit may be of as much practical value and profit as possible, that a special committee of three be appointed at this meeting, whose duty it shall be at such visit to carefully note all matters of interest, make suggestions growing out of conditions or circumstances existing, or wants to be supplied, and make a full report at our next winter meeting.

While much has been accomplished in the direction indicated, neither the college nor this society can afford to rest satisfied with what has been done. The world moves, and we must all move forward with it, or be left in the race. To forsake agricultural, mechanical, and industrial pursuits for professional, to leave the beaten path of gradual but sure accumulations for feverish speculations and buying and selling what we could not pay for or have not to sell, in the hope of gain by manipulating markets, is not evidence of advance, but rather of the decay of manhood. One great aim of this society should be to make men engaged in agriculture, stock raising, mechanical, and industrial pursuits proud of their occupation, and happy and contented in their pursuits. The Agricultural College is greatly aiding in this work by elevating the mind and character of those engaged and pointing out better and more scientific methods of work and culture, and that college and this society may efficiently work together to accomplish what both were designed to promote, and mutually bid each other, God speed.

Respectfully submitted,
W. J. BAXTER,
F. L. REED,
D. W. HOWARD.

The report was accepted and adopted.

Mr. Hanford read the report of Superintendents of Farm Implement Department, as follows:

DIVISION I—FARM IMPLEMENTS.

To the President and Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN:—The exhibition in Division I, Farm Implements, we need not say was equal to any we have ever had, for that fact was easily discerned by all lookers-on at our past State fairs. We expect that these exhibits will increase in attractiveness from year to year, as long as the present liberal policy of the society towards exhibitors is followed, and as long as our State continues to be as productive as at present. It is estimated that the improvements of the plow alone, have benefited the people of this country fifty millions a year. If this is true, what can we say of the benefit arising from the improvements in other tillage implements, haying and harvesting tools, seed drills, and planters, field rollers, etc. The value to the people is immense, not confined by any means to agriculturalists, but is shared by all. Without these improvements, it would become almost impossible to feed the people, and a "sheep's head and pluck a day" would again be the standard wages of a day laborer. The entries in the several classes were about the same as last year. Some exhibitors made their appearance this year for the first time, while most of the old ones were on hand as usual, showing that it pays to advertise their implements at our State fairs.

Time and space will not allow us to particularize or show (with justice), the merits of each exhibit. Great attention was given by visitors to the operations of twine binders, which obviates the objections to the use of wire; making a knot that will neither slip nor break, out of material as cheap. These binders fill a long felt want. There were several platform binders on exhibition (that take the grain directly from the platform), that drew large crowds, perhaps for their novelty. Sulky plows were in favor, either from a desire of farmers to ride on a cushioned seat, or from their being enabled by the use of them to do more and better work.

The shafting was not sufficient to supply all with power, as several, through choice, or otherwise, furnished their own power and shafting.

Farm engines, especially traction, keep pace with the wants of the people, and the latter were able to clear the track every time they moved. Exhibitors and people appeared to be happy (the one in taking orders, and the other in giving them), and your superintendents contented.

All of which is respectfully submitted.

H. O. HANFORD,
ABEL ANGEL,
Superintendents.

Accepted and referred.

Committee on Premiums reported:

To the Executive Board of the Michigan Agricultural Society:

Your Committee on Premium List beg leave to present the accompanying report:

Having carefully considered the list, we have made such changes as in our opinion seemed necessary in the progress of agricultural and other interests, and for the interests of this Society. Most of the changes made have the approval of the Superintendents in the several departments.

WILLIAM BALL,
WILLIAM CHAMBERLAIN,
W. H. COBB,
I. H. BUTTERFIELD, JR.,
H. O. HANFORD,
A. F. WOOD,
JOHN LESSITER,
Committee on Premium List.

Report accepted.

On motion, the Premium List for Children's Department was referred to Miss Brow and the Secretary, who were authorized to arrange a list not to exceed $50, to be published in the annual Premium List.

It was then moved that the report of the Premium List Committee, relative to Class I, be adopted.

Mr. Baxter moved to amend by striking out all the fourth premiums in this class. The amendment was lost.

The same gentleman then moved to amend by striking out the Sweepstake premiums for Michigan cattle.

A lengthy discussion was had on the question, and was participated in by Messrs. Baxter, Ball, Hanford, Smith, Sterling, Chamberlain, Wood, Brooks, Phelps and Hinds.

Mr. Gilbert offered an amendment to the amendment, which was lost.

The yeas and nays were then called for on Mr. Baxter's amendment, and the amendment was lost by the following vote:

Yeas—Messrs. Sterling, Smith, Baxter and the President—4.

Nays—Messrs. Rising, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Anderson, Gilbert and Dean—19.

The original motion was then adopted.

It was then moved and supported to adopt the balance of the report relative to Division A.

Mr. Baxter moved to amend by striking out Sweepstake premiums for Michigan cattle. Lost.

The original motion was then adopted.

It was moved and supported to adopt the report of the Committee relative to Division B.

Mr. Baxter moved to amend by striking out all special premiums for Michigan horses. Lost.

The original motion was then adopted.

Moved and supported that the report of the Committee relative to Division C, be adopted.

Mr. Baxter moved to amend, by striking out special premiums on Michigan sheep. Lost.

Mr. Chamberlain offered an amendment to the list for Class 29, Fat Sheep, which was adopted.

The motion, as amended, was then adopted.

The report of the Committee relative to Divisions D, E, F, G, H, I, J, K, L, and M, was taken up by divisions, and adopted.

The report relative to Division N was referred back to the Committee for further consideration.

The report relative to Divisions O and Q was adopted.

The recommendation of the Committee relative to Northern Exhibit was adopted.

The President appointed Messrs. W. J. Baxter, W. L. Webber and J. M. Sterling a Special Committee on Northern Exhibit.

The Committee then took a recess until two o'clock.

AFTERNOON SESSION.

The meeting was called to order at two o'clock.

President Fralick in the Chair. Quorum present.

On motion, the Committee on Northern Exhibit was authorized to make a premium list for that department, to be printed with the Premium List for 1883.

On motion of Mr. Hanford, it was voted to adopt the report of the Committee on Premiums as a whole, with the exception of the Art Department.

Mr. Baxter was, on motion, excused from further attendance at this session.

Mr. Farley, Secretary of the Ohio, Michigan and Indiana Fair Circuit, was invited to address the meeting, and made a few very interesting remarks, and suggested that a convention of delegates from agricultural societies be held during the winter.

It was moved that the suggestions of Mr. Farley relative to an agricultural convention be referred to the Committee on Fair Circuit.

The committee then took a recess till four o'clock.

The meeting was called to order at four o'clock, and as the various committees were not prepared to report, the committee adjourned until nine o'clock Thursday morning.

FOURTH DAY.

MICHIGAN EXCHANGE, DETROIT,
January 11, 1882.

The Executive Committee of the Michigan State Agricultural Society resumed its session this morning, pursuant to adjournment.

The President, the Hon. Henry Fralick, in the chair.

Roll called.

Present—President Fralick, Treasurer Dean, Messrs. Sterling, Rising, Hanford, Ball, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Parsons, Angel, Howard, Harrison, Butterfield, Gilbert, Anderson, Humphrey, and the Secretary.

On motion of Mr. Hanford, the reading of the minutes of Wednesday's session was dispensed with.

The President presented the bonds of the Treasurer and Secretary, with his approval. The bonds were referred to the Finance Committee.

Mr. Ball, Chairman of the Finance Committee, reported for that committee as follows:

To the President and Executive Committee of the Michigan State Agricultural Society:

The Committtee on Finance, to whom was referred the Secretary's report pertaining to finances, beg leave to report that they have made a careful examination of his books and vouchers, compared the checks with their proper stubs, and find the account as stated correct.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

To the President and Executive Committee of the Michigan State Agricultural Society:

The committee to whom was referred the report of the Treasurer, would respectfully report that they have examined said Treasurer's accounts with the vouchers accompanying the same, and find them to agree, and that the accounts of the Treasurer are correct.

All of which is respectfully submitted.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

To the President and Executive Committee of the Michigan State Agricultural Society:

The Committee on Finance, to whom was referred the report of the Business Committee, respectfully report that they have examined the account rendered by said committee, and have compared them with the vouchers in the hands of the Secretary, and find them correct. Also the report of said committee of amounts received for rent of booths and all other sources, were duly paid over to the Treasurer, and his receipts given for the same.

WILLIAM BALL,
E. W. RISING,
M. P. ANDERSON.

Upon motion the foregoing reports of the Finance Committee were accepted and adopted.

The committee further reported that they had examined the bonds of the Secretary and Treasurer, and recommended their approval:

On motion the report was adopted.

Mr. Cobb read a communication from the Secretary of Michigan State Association of Agricultural Societies, inviting the society to send three delegates to the tenth annual convention of that society, which will be held in the city of Lansing, on the 7th day of February next.

Mr. Cobb moved and it was supported, to appoint three delegates to the convention. The motion prevailed and the President appointed as such delegates, Messrs. W. H. Cobb, Wm. Ball, and A. F. Wood.

Messrs. C. W. Green and John Starkweather, old and honored members of the Executive Committee, were invited to address the meeting, and each made a few remarks.

Mr. E. O. Humphrey referred to the death of Hon. J. Webster Childs, and moved that a committee of three be appointed by the chair to take action on the death of Mr. Childs. The motion was unamiously adopted.

The President announced as such committee, Messrs. Humphrey, Smith, and Gilbert.

The President then announced the Committee on Programme, F. V. Smith, A. O. Hyde, G. W. Phillips.

Mr. Parsons read the report of the committee on that part of the President's address relating to the State Horticultural Society as follows:

To the President and Executive Committee of the State Agricultural Society:

GENTLEMEN—Your Committee on so much of the President's address as refers to inviting the Horticultural Society to exhibit with the State Agricultural Society in 1883, and the amount of money to be appropriated to aid in making such exhibit, would respectfully report that we have great pleasure in recommending a hearty invitation and an appropriation of $1,000, to be distributed in premiums on the same terms and conditions, if awarded, as in 1882; also $1,400 for expenses, on such amount, limited by the foregoing sums, as the wants of the said society may require. In this connection we beg leave to bear witness to the untiring energy and wisdom displayep by the officers of the Horticultural Society, in contributing to the success of the meeting of 1882.

PHILO PARSONS.
J. L. MITCHELL.
J. Q. A. BURRINGTON.

DETROIT, Jan. 10, 1883.

The Horticultural Society accepted the proposition of this society in the following letter:

January 11, 1883.

Mr. President and Members of the Executive Committee of the Michigan State Agricultural Society:

GENTLEMEN—In behalf of the Executive Committee of the State Horticultural Society I thank you for your courtesy, and accept your invitation to hold our annual exhibit with you this fall, on terms named, viz., one thousand dollars for premiums, fourteen hundred dollars for general expenses, being the same as granted last year and on same terms.

EVART H. SCOTT,
Chairman of Business Committee of State Horticultural Society.

Mr. Harrison, Chairman of Committee on Rules, read the report of that Committee, which was taken up section by section. Section VI, relative to liquors, was reported as follows:

"No spirituous or malt liquors shall be allowed to be sold on the Fair grounds during the Fair."

It was moved and supported to adopt the section.

It was moved to amend by inserting the rule adopted last year.

The amendment was carried by the following vote:

Yeas.—Sterling, Rising, Hanford, Lessiter, Cobb, Mitchell, Hyde, Smith, Wood, President, Treasurer, Secretary.—12.

Nays.—Ball, Reed, Burrington, Angel, Chamberlain, Parsons, Howard, Harrison, Butterfield, Anderson.—10.

Other changes and amendments were voted, and the report adopted as a whole, as follows:

BY-LAWS.

BY-LAW NO. 1.—The annual meeting of the Executive Committee of this society shall be held, commencing on the second Monday in January, in each year, at 8 o'clock P. M., of that day, and at such place as the President shall appoint; and at least one weeks notice of the place shall be given, by mail, to each member of the Committee, and also through the press to all persons interested.

BY-LAW NO. 2.—At each annual meeting of the Executive Committee there shall be appointed, in such manner as the Committee may decide, eight Standing Committees, each to consist of three members, except Committee on Premiums, which shall consist of seven members, as follows:

1. Business Committee.
2. Transportation Committee.
3. Finance Committee.
4. Committee on Premiums.
5. Committee on Rules and Regulations.
6. Committee on Printing and Advertising.
7. Committee on Reception, to look after guests, visitors, and strangers.
8. Committee on Programme.

BY-LAW NO. 3.—The president of the society shall be *ex officio* a member of each of the foregoing committees, in addition to the other members, and if present at any committee meeting, shall have the right to preside. Special committees may be appointed by the Executive Committee, as may seem best, and charged with such duties as the Executive Committee may order.

BY-LAW NO. 4.—The president of the society shall be chairman at all meetings of the Executive committee at which he may be present. In his absence, such member of the committee as shall be chosen for that purpose shall act as chairman.

BY-LAW NO. 5.—The secretary and treasurer shall each, within one month from this date, and hereafter, on or before the second Monday in January in each year, give bonds conditioned for the faithful performance of the duties of the respective offices, and the accounting for and paying out of all moneys coming into their hands, respectively, and the delivery to their successors in office of all money, property, and effects in their hands, belonging to the society, on or before the second Monday in January in each year. The penalty of the bond of the secretary shall be $1,000. The penalty of the bond of the treasurer shall be $30,000. Each of said officers shall furnish bonds with securities satisfactory to the Finance Committee, who shall endorse their approval on said bonds.

BY-LAW NO. 6.—The secretary of the society shall act as secretary of the Executive Committee. In case of his absence, inability or refusal to act, the committee may appoint a secretary *pro tem*

BY-LAW NO. 7.—The secretary shall have the privilege of selling membership tickets, for the purpose of making entries, up to and including the second day of the fair, and at the close of business on said day, shall report to the treasurer of the society the number of tickets sold, and pay to the treasurer the balance then in his hands received therefor. He shall also report an inventory of the property in his office belonging to the society, at each annual winter meeting of the Executive Committee.

BY-LAW NO. 8.—When clerical assistance is required by the secretary, no clerks shall be employed by him for the benefit of the society without consultation with and the consent of the president of the society, both as to employment and compensation, and all bills for services of such clerks shall be certified by the president and secretary before being allowed.

BY-LAW NO. 9.—No pecuniary consideration or inducement, other than the premiums offered, shall be paid to exhibitors entering for premiums.

BY-LAW NO. 10.—All moneys received by the officers, or by members of the Executive Committee, for the society, shall, as soon as practicable, be paid over to the treasurer, and his receipt therefore taken, and no money shall be paid out for the society except by the treasurer, who shall pay on proper orders drawn on him for the purpose. The order so drawn shall show the specific object for which the same was given.

BY-LAW NO. 11.—Except for investment and orders for premiums duly awarded, no order shall be drawn on the treasurer, except on accounts duly audited and allowed by the Business Committee, and such allowance endorsed thereon by a majority of such committee.

BY-LAW NO. 12.—An appeal may be taken in all cases from the action of any standing committee to the Executive Committee, but the decision of such standing committee shall be considered as the rule governing the case until the Executive Committee shall otherwise order.

BY-LAW NO. 13.—It shall be the duty of the Business Committee to carry out the instructions of the Executive Committee in relation to the pecuniary affairs of the society, and in regard to preparing for and holding fairs. The Business Committee shall keep a record of all accounts allowed, and shall allow no accounts except such as show the items and appear to be correct and duly authorized. They shall make a full report of all accounts allowed by them, and other orders made by them, at each annual meeting of the Executive Committee.

BY-LAW NO. 14.—The Business Committee shall have the general charge of the property of the society (except the moneys in the hands of the treasurer, and property in the office of the secretary) and in relation thereto shall obey such instructions as the Executive Committee shall give from time to time. Such Business Committee shall properly care for such property, and shall report annually to the Executive Committee the amount or quantity, situation and condition of the same.

BY-LAW NO. 15.—Superintendents of departments may, with the consent and approval of the president, employ such assistants and judges as they deem necessary for the good management and control of their departments, settle expenses of same, including board, settle their own bill, and present the bill in the usual form for approval and payment on the last day of the fair.

BY-LAW NO. 16.—It shall be the duty of each superintendent in charge of a department, at the annual fair of this society, to present to the Executive Committee, at the winter meeting succeeding each fair, a written report upon the exhibition in his department, which report shall form a portion of the proceedings of this society, and be published therewith; and when the Pomological Society exhibits with this society, the superintendent of that exhibition is requested to present a like report.

BY-LAW NO. 17.—No diploma shall be offered or awarded as a premium, except in cases where a cash premium of at least twenty-five dollars ($25) would be required as a proper premium.

BY-LAW NO. 18.—No obligations against this society shall be created by any officer of the society or member of the Executive Committee, without the written consent of the president or chairman of the Business Committee.

BY-LAW NO. 19.—In all cases where no other provision is made, the said Executive Committee shall be governed by the rules of parliamentary law, laid down in Jefferson's manual.

BY-LAW NO. 20.—The order of business at each meeting of the Executive Committee shall be as follows:

1st. Calling the roll.
2d. Reading and approving the proceedings of the last meeting.
3d. Addresses and communications from the president.
4th. Reports from standing committees.
5th. Reports from special committees.
6th. Reports from executive superintendents.
7th. Hearing appeals and considering same.
8th. Unfinished business.

9th. Miscellaneous business.
10th. Motions and resolutions.
11th. Notices.

This order of business may be suspended or changed, for that meeting only, by a two-thirds vote of the members present at any meeting of the Executive Committee.

GENERAL RULES AND REGULATIONS.

I.—MEMBERS.

SECTION 1. Any person may become a member of this society for one year by paying one dollar into the treasury. He will receive an annual certificate of membership, with one coupon admission ticket attached.

SEC. 2. Members are entitled to the privilege of voting and holding office, and competing for all premiums in any department, without further payment.

SEC. 3. Life members shall be entitled to the same rights and privileges in all respects as other members of the society.

II.—OFFICERS.

SECTION 1. The Executive Committee will meet on the evening of each day of the fair at 7½ o'clock, at such place as the President shall designate, to transact such business as may be brought before them, and to hear reports of executive superintendents.

SEC. 2. Officers will be designated by ribbon badges, with the name of the office printed thereon.

SEC. 3. The President's and Superintendent's office, during the days of the fair, will be on the fair grounds.

SEC. 4. The President of the society will be at his office on the fair grounds at 9 o'clock A. M. each day for the transaction of business. He may confirm the nominations of all assistants made by the members of the Executive Board in charge, and give general direction to the exhibition, and see that the published rules are executed.

SEC. 5. The Secretary's office will be on the fair grounds each day of the fair, where all business of his department will be transacted.

SEC. 6. The office of the Marshal will be near the entrance gate, and distinguished by a red flag.

SEC. 7. The office of the general superintendent of the grounds, during the fair, will be at the President's office.

SEC. 8. Each department will be in charge of one or more members of the Executive Committee, and exhibitors and judges will apply to such superintendent for instructions in his department. Such superintendents of each division shall be provided with a suitable office in the department of the hall and grounds assigned to them, which shall be designated by appropriate and conspicuous signs. Superintendents of departments requiring an assistant may appoint such assistant by and with the advice and consent of the President. Each superintendent of a department may also appoint a messenger, and if more than one messenger is considered necessary in any department, additional messengers may be appointed by and with the advice and consent of the President. Each superintendent of a department shall in person or by his assistant and messenger be present at his office during the hours of exhibition.

III.—ELECTION OF OFFICERS.

SECTION 1. The annual election of officers will take place on Thursday of the week of the fair, and the secretary shall give public notice of the same through the posters and regular advertisements of the fair, and such election shall be conducted as follows: The Executive Committee shall provide a proper ballot box, to be kept at some convenient place on the fair grounds, and they shall appoint three proper persons, who shall conduct the election and receive the ballots of all the members who are entitled and shall offer to vote, and said judges shall require each person offering to vote to present the proper certificate of membership, and shall keep a full register of names of all persons voting at such election. The polls of such election shall be open at 9 o'clock A. M., and be closed at 5 o'clock P. M., on Thursday of the week of the Annual Fair. In case of a tie vote the judges shall decide the matter in the manner provided by law for deciding the votes at township elections. The judges of election, together with the President of the Society, shall duly canvass the votes so cast, and shall publicly announce the result immediately thereafter. The following rules shall govern such election:

SEC. 2. The Executive Committee shall, on the first day of the Fair, appoint three persons, who shall be members of the Society, to act as judges of the election, and shall at the same time fix the place on the Fair grounds where the election shall be held.

SEC. 3. Notice of the names of the judges and the place where the polls will be held, shall be given on the second day of the Fair, by publication and posting notices in at least twenty prominent places on the Fair grounds.

SEC. 4. The names of all the officers to be voted for shall be on one ticket.

SEC. 5. Each member shall vote in person. All annual members shall present a membership certificate, which certificate the judges of election shall stamp to show that the same has been voted upon; and the judges shall also take the names of all life members who desire to vote and register the same, including the names of annual members, in a poll list, and shall then deposit the ballot in the ballot box provided for that purpose.

SEC. 6. If any judges of elections appointed by the Executive Committee be not present at the opening of the polls, the President shall immediately appoint some person or persons from among the members of the Society to fill such vacancy or vacancies.

SEC. 7. Each of the judges shall, before entering upon the performance of his duties, subscribe a declaration that he will faithfully and impartially act as a judge of such election, and such declarations shall be filed with the Secretary. The Secretary shall procure the necessary blank forms for such declarations.

SEC. 8. The person having the highest number of votes for the office of President shall be declared elected, and a like rule shall be observed for the office of Secretary and Treasurer. The persons voted for as Executive Committee, to the number to be elected, having the highest number of votes, shall be declared elected.

SEC. 9. Poll-lists shall be made to agree with the count of ballots; votes folded together, and fraudulent and duplicate votes shall be governed by the rule prescribed by law for the government of township elections.

IV.—BOOTHS AND SHOWS.

When booths or grounds are leased, no admission tickets for lessees or assistants shall be given, nor shall any teams or employés with supplies be admitted between 8 A. M. and 6. P. M., during the Fair, without regular admission tickets.

V.—BILLS AND CLAIMS.

Persons having claims against the Society must present them to the Business Committee before the close of the Fair. No claims will be paid unless examined and certified to by the Business Committee, or a majority thereof.

VI.—LIQUORS.

No spirituous or intoxicating liquors shall be allowed to be sold on the fair grounds during the fair.

VII.—AWARDING OR VIEWING COMMITTEES.

The superintendent shall appoint the Viewing Committees to act in the several departments under their charge.

SECTION 1. The Awarding Committees are requested to report, as soon as they arrive upon the grounds, to the superintendent of the division in which they are to serve, who will record their presence and inform them when their committee will be called upon to act.

SEC. 2. On entering upon their duties, Awarding Committees will receive their committee books and instructions relative to their work, from the superintendent in charge, to whom they will apply in all cases of doubt or difficulty.

SEC. 3. Superintendents in charge will appoint the time for each committee to act; they will fill all vacancies in committees, and when the reports are finished they will be returned to the superintendent.

SEC. 4. Each superintendent in charge will see that the committee upon each class in his department report fully upon each article or animal in each class.

SEC. 5. Committees will examine the Premium List with care; they will in no case award a premium where there is no merit, though there be no competition, and in cases of partial merit, a 2d or 3d premium may be awarded, though no 1st or 2d premium be given. No discretionary premium shall be recommended by Viewing Committees, except it be for articles or animals not enumerated.

SEC. 6. Awarding Committees will be particular to have the number of awards, etc., entered in their books correctly, and when they have made their report they shall sign the same, and hand it to the superintendent in charge as soon as possible. The superintendent will examine the same, and when satisfied as to its correctness will deliver it to the secretary, who shall report to the Executive Committee during the week of the fair.

SEC. 7. Awarding Committees are especially requested to do impartial justice both to exhibitors and to the society.

SEC. 8. No person or persons will be allowed to interfere with Awarding Committees in discharge of their duties.

SEC. 9. Awarding Committees on cattle and horses will please have the prize ribbon tied upon the animals before sending them from the rings.

SEC. 10. No person shall act as superintendent of any department in which he is an exhibitor, nor shall any exhibitor act as a member of any Viewing Committee in any class in which he is a competitor.

SEC. 11. Any person who shall attempt to interfere with the judges while in the discharge of their duty, or who shall afterwards on the premises of the society, use any disrespectful or abusive language to any judge or judges with reference to any of their decisions or awards, or shall make any changes in the arrangement of the stalls or pens without the consent of the superintendent in charge thereof, shall forfeit his right to any premium to which he might otherwise be entitled, and shall be excluded from exhibiting for one year thereafter.

VIII.—ADMISSION.

SECTION 1. The gate will be opened at 8 o'clock A. M. of each day, at which time every officer and employé is expected to be at his post of duty.

SEC. 2. Single tickets of admission at 50 cents each, and tickets for children under sixteen years of age at 25 cents each, will be for sale at the treasurer's office. All tickets will be taken up at the gate, as they are good for one admission only. Children under eight years of age, free.

SEC. 3. One horse and rider must have two tickets; one horse, carriage, and driver, two tickets; two-horse vehicle and driver, three tickets. For each person other than driver, in any vehicle, one ticket will be required.

SEC. 4. Admission to the grand stand will be 25 cents for each admission. Children under eight years free. The grand stand will be cleared by the police, and swept during the recess from 12:30 to 1:30 P. M. each day.

SEC. 5. Editors and reporters will obtain tickets of admission from the president

IX.—EXHIBITORS.

SECTION 1. Competition is open to all, regardless of locality, unless otherwise specially provided.

SEC. 2. Exhibitors must be members of the society. Those making their entries by letter will remit the amount of the membership fee with their entries to the secretary.

SEC. 3. As the fair opens on Monday, officers of the society will be in their respective places, at the fair grounds, on Friday and Saturday of the week previous to the fair, to receive entries and arrange articles. To avoid hurry and confusion, the entries should, as far as possible, be made the week before the fair.

SEC. 4. All entries in Divisions A, B, C, and D, shall be made on or before Tuesday evening of the week preceding the fair, and all entries of machinery and articles in Division E, and in Classes 39, 40, 41, 42, 43, and 44 of Division I, and Classes 46 and 47 in Division K, must be made on or before Thursday evening of the week preceding the fair. All other articles must be entered and in their proper places on or before Tuesday, the second day of the fair, at 2 o'clock P. M.

SEC. 5. Persons entering live stock must, at the time of entry, give a list of the stock, stating the age and breed of the animals, the breeder's name and residence, and the particular class and division in which the animal is to be entered; and in case of thorough-bred, full pedigrees, duly certified, must be filed at the same time.

[NOTE.—An authenticated pedigree or statement of breeding should contain an affidavit of the breeder, stating description of the animal, with the date of its birth, and the date of its sale, if out of his hands, and the names or description of the sire and dam.]

SEC. 6. Copies of the premium list and blank forms for entries will be furnished on application to the secretary. Exhibitors should make themselves acquainted with the premium list and requirements, and be sure in what class and division their entries properly belong, as it will be the duty of the judges to rule out any animal or article not answering to the entry. No change or alteration is permitted after the books are placed in the hands of the committees. Entries may be made for exhibition without competition, and Viewing Committees in the several classes may notice such as they shall deem worthy in their reports. But all entries must be made members of the society. Except for the herd and sweepstakes premium, no animal or article can be entered in more than one class, or compete for more than one premium.

SEC. 7. The society reserves the right to refuse any entries offered, particularly such as require an unreasonable amount of room. All exhibitors must (except in the case of live stock) state at the time of entry the space required by them, in order that proper quantity of space may be reserved.

SEC. 8. Goods and stock must be delivered on the grounds and put in place by exhibitors, and must not be removed until 4 o'clock P. M., of the last day of the fair.

SEC. 9. Exhibitors wishing to erect separate buildings, and exhibitors requiring additional work in buildings or elsewhere, must apply to the President. In all such cases the exhibitor must bear the expense.

SEC. 10. Exhibitors will not be allowed to sell goods, *except on the last day of the Fair* (though they may receive and book orders, and all articles and animals may have the price of each attached), nor will they be permitted to call attention to their wares in a noisy or disorderly manner.

SEC. 11. All entries must be made in the name of the owner, or the names of the joint owners, actual growers, producers, inventors or manufacturer. The penalty for transgression of this rule will be exclusion from the present exhibition of the Society,

SEC. 12. The name and residence of the exhibitor, and number of exhibit in the class, will be entered in the Secretary's books, upon entry cards, and upon books of the Viewing Committee.

SEC. 13. Ample space and facilities for exhibition and display of articles, implements and machines entered for exhibition only, and not for premiums, will be furnished, and to all such a card or label may be attached, giving name and residence of exhibitor, name of machine, use and retail price.

SEC. 14. Every article or animal upon the Fair ground will be under the control of the Executive Committee, and every precaution will be taken for their safe keeping, but the Society will not be responsible for any loss or damage that may occur, and upon this condition entries are received.

SEC. 15. ☞ Exhibitors having articles or animals on exhibition which require their constant supervision, care and attention, will be furnished with entrance tickets on application to the Superintendent in charge of the several departments, at such Superintendent's direction, which tickets will be taken up on presentation at the gate. A separate gate will be set apart for such exhibitors at which all holders of exhibitors' tickets must enter. Every exhibitor shall give to the Superintendent in charge of his department, a list of all assistants he may need in his department, and such Superintendent shall furnish a list of such names to the Superintendent of Gates, and every renter of booths or stands, shall make out a list of the names of the person or persons under his or her control, necessary to aid him or her in their exhibition or business, and present it to the Superintendent of Gates, who shall give a copy of such list to the gatekeeper, with instructions to check the name of every holder of such tickets, for every entrance he or she may make upon the Society's grounds during its Fair.

Superintendents will procure such attendants' tickets at the office of the President, and each Executive Superintendent shall personally be at his office from 4 to 5 o'clock P. M., during each day of the Fair, during which time exhibitors entitled to such attendants' tickets shall personally apply for the same, and the Superintendent shall keep a record of the names of such exhibitors, and the number of tickets daily supplied to each.

SEC. 16. So far as possible space in proper hall shall be assigned to each particular division and class, and articles entered for premiums must be assigned to the space thus set apart. The crowding of articles of an entirely different class and character into space thus set apart for any particular class should be avoided.

SEC. 17. The entries in the several departments shall be arranged as nearly as possible as follows:

Cattle—In the stables assigned them, the several breeds as nearly as practicable ranged together.

Sheep and Swine—In the pens according to their breed.

Horses—In the stables as they may be assigned by the Superintendent of the Horse Department, with open doors in the daytime, unless the superintendent in charge shall, in his discretion, allow the door to be closed.

X.—PREMIUMS.

SECTION 1. The award of premiums will be designated as follows: First premium, by a blue ribbon or card; the second premium by red ribbon or card; third, by a white ribbon or card; and fourth, by a yellow ribbon or card.

SEC. 2. The Society reserves the right to withhold the premiums in every case in which it shall appear to the Executive Committee that the regulations have not been complied with, or that fraud or deception has been practiced or attempted.

SEC. 3. Premiums are payable in cash. The medals and diplomas will be delivered by the Secretary as soon as possible after the Fair. Premiums will be paid by the Treasurer upon presentation of premium check drawn by the Secretary and countersigned by the President.

XI.—PROTESTS.

SECTION 1. All protests against the awards of Viewing Committee must be in writing, and must state particularly the grounds thereof; and no protest will be considered unless for some cause other than errors of judgment on the part of the Viewing Committee. All protests must be filed with the Secretary on or before the last day of the Fair, or they will not be entitled to receive attention.

SEC. 2. When a protest is regularly made, the same shall be referred to a special committee, whose duty it shall be to ascertain and report the facts to the Executive Committee, and such report shall be deemed final, and on the facts so reported the Executive Committee shall determine the case.

XII.—DIVISION J—MACHINERY.

Competition open to the World.

SECTION 1. Saturday previous to the Fair, all parties desiring space in this department, must apply therefor to the Superintendent in charge of said department.

SEC. 2. The Secretary shall give each person making an entry in this department a printed copy of this rule at the time such entry is made.

XIII.—GENERAL RULES FOR LIVE STOCK—SHEDDING AT DISCRETION OF SUPERINTENDENTS.

Competition Open to the World, excepting Classes 19, 20, 20½ *and* 21.

SECTION 1. No animal may compete for more than one prize in any class or division, except for the herd or sweepstake premiums.

SEC. 2. Each animal will be required to be placed on the ground, in the division to which it belongs, by the agent or owner who has it in charge, and in the place assigned to it by the officer of the Society having charge of that department.

SEC. 3. Stalls, stables and pens are provided for live stock, but where room cannot be made, then the Superintendent may permit such animals to have admission to the grounds at such times as he may deem proper. Places may be assigned in the order of application. No loose animals shall remain on the grounds.

SEC. 4. Hay and straw will be provided for live stock on the grounds, free of charge, from the Saturday preceding to the close of the Fair, in the following quantities per day:—Hay for cattle, 20 lbs.; for horses, 15 lbs.; for sheep, 3 lbs., and straw sufficient for bedding.

SEC. 5. Exhibitors in Divisions A, B and C will secure certificates from the Superintendents of their departments, stating the amount of hay and straw they are entitled to draw, and shall present the same to the Superintendent of Forage.

SEC. 6. Grain and feed will be provided for sale upon the grounds, at the usual market rates.

SEC. 7. Horses or other stock occupying stalls or pens must be entered on the books of the Secretary for exhibition, and if not shown in competition when called for by the Awarding Committee, shall be charged one dollar per day for the time the stall or pen is occupied.

SEC. 8. Grooms must be neatly and cleanly dressed when they lead out their stock for exhibition.

SEC. 9. No person other than the judges will be permitted to go into the rings where the stock is exhibited, except the officers of the society or the Marshals, except upon the invitation of the Superintendent in charge.

SPECIAL RULES ON CATTLE.

Competion Open to the World except Sweepstake for Bull and four of his get.

All exhibits in Division A, must be owned by the exhibitor and in his possession at least sixty days previous to the Fair.

That all animals entered as thorough-breds in Division A shall be judged by a scale of points to be arranged under the direction of the Superintendent in charge of that department.

That the superintendent of Division A shall appoint a Special Committee on Pedigrees.

That no animal entered as thorough-bred in Division A shall be admisible to the showing without a certificate of eligibility from the Committee on Pedigrees.

All entries of cattle for exhibition shall be made on or before the Tuesday preceding the week of the Fair, and the full pedigrees of all the animals entered shall accompany such entries, and the Secretary shall keep a file of all such pedigrees, each breed by itself, for the convenience of the Committee on Pedigrees.

It is understood that in Shorthorns the American Shorthorn Herd Book, The English Shorthorn Herd Book, Kentucky Shorthorn Record, and the American Shorthorn Breeders' Herd Book, shall be considered the authority by which pedigrees shall be judged.

In Devons: The American Devon Herd Book and Buckingham's Devon Herd Record.

For Ayrshires: The North American Ayrshire Register and the Ayrshire Breeder's Record.

Jerseys: The American Jersey Cattle Club Herd Register.

For Herefords: The English Hereford Herd Book and the American Hereford Record.

For Holsteins: The American Holstein Herd Book, the Dutch Friesean Herd Book.

For Galloways: The Polled Galloway Herd Book of Scotland, or such evidence of purity of blood as shall be satisfactory to the Committee.

☞In all cases of thorough-bred cattle, only those of approved pedigree will be permitted to compete. All animals of approved pedigree will be considered equal as to pedigree, no one strain of pure blood having preference over others in the prize ring.

All three-year-old heifers in the several classes of breeding stock, shall be required to have borne a calf previous to the exhibition, or the heifer cannot compete.

Examination of cattle will take place on Tuesday from 1 o'clock P. M., and continue during the forenoon of Thursday from 9 o'clock till 2 in the afternoon.

Bulls more than a year old must be secured by a ring in the nose, and otherwise secured to the satisfaction of the Superintendent, or they will be debarred from remaining on the ground.

DIVISION B—HORSES.

Competition open to the World excepting Classes 19, 20, 20½, *and* 21.

All enteries in this division must be made on or before the Tuesday previous to the Fair.

Horses to compete for premiums must be sound, except in cases of stallions or mares injured by accidents which do not impair them for usefulness.

Exhibitors of horses will be required to test the animals they may exhibit, under the direction of the several committees which may have charge of the class in which the entries are made. Strict obedience to the directions will be required, as the Committee have full power to rule out of competition all who do not comply with their requirements.

Horses possessing no merits may be ordered off the grounds by the Superintendent.

The Superintendent having charge of the exhibition of horses will have full possession and command of the track during the time of such exhibition, and Marshals will be at his command for all purposes of order and enforcement of rules.

All animals shown in this division must have been owned and in possession of the exhibitor for sixty days previous to the entry for exhibition.

DIVISION C—SHEEP.

Competition open to the World except Class 22.

Sheep must in all cases, have been evenly and closely shorn, not earlier than the fifteenth of April before the Fair, and the date of shearing must be certified at the time of entry.

All ewes, three years old or over, except Class Fat Sheep, are required to have bred a lamb during the present year, and all sheep shall be entered and compete only in their respective classes. Pens shall consist of two in number, unless otherwise specified.

All enteries in this division must be made on or before Tuesday of the week previous to the Fair.

All sheep entered as thorough-bred American Merinos shall be registered, or be eligible to registry, in the Vermont, Michigan, New York, or Ohio Register.

All animals shown in this division must have been owned and in the possession of the exhibitor at least sixty days previous to the entry for exhibition.

DIVISION D—SWINE.

Competition Open to the World.

All animal shown in this division must have been owned and in the possession of the exhibitor at least sixty days previous to the entry for exhibition.

All enteries in tnis division must be made before Tuesday previous to the Fair.

Swine in the Berkshire class shall not be recognized as eligible to entry unless they trace to animals recorded in the American Berkshire Record.

DIVISION E—POULTRY.

Competition Open to the World.

All animals shown in this division must have been owned and in possession of the exhibitor at least sixty days previous to the entry for exhibition.

All entries in this division must be made on or before Thursday previous to the Fair.

Respectfully submitted.

C. A. HARRISON,
J. Q. A. BURRINGTON,
A. F. WOOD,
J. M. STERLING.

Mr. Parsons, Chairman of the Committee appointed at the Lansing meeting to examine into the management of the Agricultural College and College Farm, read the report of the committee. The report was, on motion, accepted.

It was then moved and supported to adopt the report.

Mr. Harrison moved as an amendment that the report be printed and tabled.

Mr. Parsons moved as an amendment to the amendment that the report be laid on the table until after dinner. Carried.

Mr. J. M. Sterling, from the committee appointed to attend the meeting of the American National Agricultural Association, reported as follows:

Your committee, appointed to attend the convention of the American National Agricultural Association, held in the city of Chicago last December, would respectfully report, that they attended said meeting, which was a very pleasant and profitable one to themselves, and at that convention there was a committee of five from each State appointed as an advisory committee to meet with the Executive Committee of the Association at the annual meeting to be held in New York city February next, and the following persons were appointed for Michigan: Hon. Henry Fralick, W. L. Webber, J. M. Sterling, W. H. Cobb, and A. P. Swineford.

J. M. STERLING,
A. J. DEAN.

The report was, on motion, accepted and adopted.

The Committee then took a recess for dinner.

AFTERNOON SESSION.

The Committee resumed business at 2 o'clock P. M., President Fralick presiding.

Quorum present.

President Fralick appointed Messrs. Chamberlain, Wood and Lessiter a Special Committee on College Farm, to note matters of interest, etc.

On motion of Mr. Wood, it was voted to reconsider the action of the Committee in adopting the report of the Committee on President's Address.

Mr. Sterling moved to amend the report by increasing the number of the committee on permanent location from five to nine.

The amendment was adopted.

It was then moved and supported to adopt the report as amended. Carried.

The President appointed the Business Committee, Transportation Committee, President, Treasurer, and Secretary a committee to secure propositions for permanent location.

The Committee on Rules read the following supplementary report:

Add the following to Art. IX, Sec. 5, Rules and Regulations:

When entries are sought to be made by mail in any department, such proposed entries shall not be received by the Secretary unless the envelope in which they are contained bears post mark as of the day preceding the day of closing of entries in each respective department in which such entries belong.

Accepted and adopted.

On motion, the report of the Committee on Agricultural College was taken from the table.

Mr. Chamberlain moved, and it was supported, to refer the report back to the committee. Carried.

Mr. Morrison, President of the Kalamazoo County Agricultural Society, addressed the meeting, and invited the Society to hold its next Annual Fair at Kalamazoo.

Mr. Parsons invited the Society to hold the Fair of 1883 in the city of Detroit.

Dr. Mitchell stated that the citizens of Jackson would be prepared to make a proposition for the Fair as soon as the Locating Committee were ready to receive propositions.

Mr. Wood then stated that the Eastern Michigan Agricultural Society would soon be in shape to make a proposition.

On motion of Mr. Chamberlain, the subject was referred to the Locating Committee.

The special committee appointed to take action in reference to the death of Hon. J. Webster Childs, reported as follows:

To the President and Directors of the Michigan State Agricultural Society:

GENTLEMEN—Your committee to whom was assigned the duty of putting into form and giving expression to the sentiments of this committee in memory of our late brother and co-laborer, the Hon. J. Webster Childs, respectfully report:

There are times in the history of societies as of individuals, when words are barren things, and we shall probably fail in meeting your expectations in paying a proper tribute to our deceased brother.

Years of active, faithful, and unselfish public services on this committee, in the legislative councils of the State, and in various agricultural organizations, endeared him to a wide circle of friends, who join with the family in mourning his loss. This committee especially tenders its sympathy, and congratulates those upon whom the blow falls most heavily upon the good name and example left as an enduring inheritance.

E. O. HUMPHREY,
F. V. SMITH,
JOHN GILBERT,
Committee.

Mr. Dean moved, and it was supported, that the report be adopted and printed in the proceedings of this meeting, and that a copy of the resolutions be mailed to the family of the deceased, Carried unanimously.

Mr. Parsons again read the report of the Committee on College Farm.

On motion, the report was accepted.

Mr. Harrison then moved to strike out all that part of the report relating to Ayrshire cattle. A lengthy discussion was had on the question, in which most of the members took part.

The ayes and nays were called for, and the motion was lost by the following vote:

Ayes—Messrs. Sterling, Chamberlain, Harrison, and Gilbert—4.

Nays—Messrs. Rising, Hanford, Ball, Lessiter, Mitchell, Hyde, Reed, Smith Burrington, Wood, Parsons, Angel, Howard, Butterfield, Anderson, the President, Treasurer, and the Secretary—18.

The report was then on motion adopted, as follows:

To the President and Executive Committee of the State Agricultural Society:

GENTLEMEN—Your committee charged with the responsibility of examining into the management of the Agricultural College and College Farm, and reporting to your honorable body, beg leave to say, that their opportunities for observation and examination have been too limited to make such report as will meet your expectations, or do justice to the great interests involved, yet they have from their own personal observations and inquiries, positive views and convictions in relation to this institution and its usefulness to the State. As you are well aware, the location in point of natural richness of soil was unfortunate, much of the cultivated part of the farm being of light soil, requiring constant enrichment to secure satisfactory returns. Of course, under no circumstances was it ever expected that the enterprise would be in any sense pecuniarily remunerative. The design in each and every step the institution has taken, has been "educational" and the results secured in relation to individual graduation do not by any means or in any principal degree, measure its wise, favorable influences upon the State. For a long period it occupied a doubtful position, lacking the confidence and earnest sympathy of the very interest it was established to subserve. It was a first experiment in the whole country—looked upon with jealousy by our own State, the needed funds required for development in its early history being often withheld. It therefore, encountered hostility and discouragement. It had a trial period—less severe, perhaps, than institutions sustained by the voluntary contributions of the public, but still of a nature to materially hold in question the wisdom of its establishment. It has, however, passed through that crisis, and the universal verdict of those most familiar with its methods of imparting instruction, and its efforts to develop into a noble manhood the students brought under the influence of the faculty, is that it has vindicated its right to existence, and to the material aid the State has extended. It is no trifle to build up an educational institution under most favorable circumstances, and especially where precedents are to be established and a new track laid out. It seems to have been a step in the right direction, and a wise one for the farming interest of the State. It is estimated that fifty per cent of the students graduated make farming the occupation of their lives. Admitting this to be true, the practical and wise influence over the State of such a power, can hardly be overestimated. It broadens and elevates the agricultural interest, giving character, independence and self-assertion. Those best acquainted with the intellectual and practical development resultant from the courses of instruction in this college believe that its failure would be a serious public calamity, and that its support in this great farming State should be willing and generous.

The institution appears thorough and satisfactory, and the hearty accord which exists between the faculty and students is an evidence of the high character of the institution and its due appreciation. The influence for good of this institution is not confined to the college proper. The series of Farmers' Institutes under the control of the faculty are a rich boon to all who come under their influence. Thus far, your committee, without any undue prejudice in favor of this institution, are of opinion that it is wisely managed, and is steadily answering the ends of its organization; but we believe it has another duty to perform in the establishment of a department of mechanics. The law which created the college authorized this department. It is of recognized value in similar State Institutions, and we earnestly recommend its consideration by the legislature now in session.

The stock at the college has been greatly improved. We find them kept in fair breeding condition and they are economically fed. Some cattle have been added to the herds the past year. The Hereford and the Holstein cows are very fine specimens of these breeds.

After looking at the cattle and examining the milk records published in the report of the superintendent, we are inclined to the opinion that the resolution of the board requiring that a herd of Ayrshire cattle be kept on the College Farm is a mistake. Their small size, combined with, to say the least, only a moderate milk record, do not commend them specially as a dairy breed for our State.

In view of the rapid increase in the dairy interest, the establishment of a dairy at the college would seem desirable, and instruction for the students in the best method of butter dairying, would be advantageous.

The feeding and fattening of stock is also in the line of practical instruction to the student, and this is one of the principal objects of the farm in connection with the college.

In the sheep department there are a few well-bred registered merinos and some good southdowns. The flocks, as a whole, present a fair, not a striking appearance.

The swine are very good specimens of their respective breeds.

The crops on the farm for 1882 have been good. Wheat averaged 35 bushels per acre, oats 60 bushels, hay two tons, and corn estimated at 40 bushels. Much good and permanent work is being done in draining, and it is hoped that the unsightly and unprofitable land on the farm will soon be in a condition to bear abundant crops. While there is so much undrained and unimproved land on the college farm, there would seem to be no necessity for slack labor for students. The weather was unfortunately so bad at the period of our last visit, and the time so short, that your committee were unable to make much examination of the growing crops.

A bill has been introduced into Congress for the purpose of making an appropriation for establishing agricultural experimental stations at the agricultural colleges in the various States, and experimental stations must come sooner or later; and we view with approval this effort to have them established through appropriations of the general government. There can be no more suitable place for the dissemination of information obtained at such stations than the agricultural college, and there is no reason to believe that the special work of such stations cannot be as well done at the colleges as at any other place; while the expense would be much less than at a station apart from the college.

We trust the best systems of practical agriculture will be taught and applied at the college, to the end that the students who graduate at the college may be familiar with the best methods and know how to apply them profitably to the farm. The people look for the college to lead in agricultural improvement.

Respectfully submitted,
PHILO PARSONS,
I. H. BUTTERFIELD, Jr.,
F. L. REED,
Committee.

Mr. Butterfield offered the following, which was adopted:

Resolved, That our next annual fair be held, commencing on Monday, September 17th, to and including Friday, the 21st, 1883.

Mr. Hyde offered the following, which was adopted:

Resolved, That the salary of the secretary be one thousand dollars per annum, and that the treasurer be allowed a bookkeeper at a salary of four hundred dollars.

Mr. Sterling, chairman of the Transportation Committee, submitted the following report, which was, on motion, adopted:

The Committee on Transportation report, that the following railroads have granted such reasonable requests as your committee have asked since our last annual meeting, and we recommend a resolution by the Executive Committee acknowledgthe same.

The roads entitled to this acknowledgment are, the Michigan Central, Detroit, Grand Haven & Milwaukee, Flint & Pere Marquette, Detroit, Lansing & Northern, Grand Rapids & Indiana, Lake Shore & Michigan Southern, and the Wabash, St. Louis & Pacific.

J. M. STERLING,
W. J. BAXTER,
W. L. WEBBER.

Mr. Dean offered the following, which was adopted:

Resolved, That this society recognize and appreciate the great obligations they are under to the several railroad companies of this State, who have, as we are informed by the chairman of the Transportation Committee, manifested a disposition to grant in the future, as they have in the past, all reasonable requests of this society, or its committees, and as evidenced on the part of the officers of the Michigan Central, Detroit, Grand Haven & Milwaukee, Flint & Pere Marquette, Lake Shore & Michigan Southern, Detroit, Lansing & Northern, and Wabash, St. Louis & Pacific.

Resolved, That the thanks of this committee are due and are hereby extended to the various railroad companies of the State for such favors and courtesies.

The Committee on Premiums reported a revised list for the Art Department.

Mr. Brow suggested that a diploma be offered for premium on collection of architectural drawings, instead of a cash premium.

On motion, the suggestion from Mr. Brow was adopted, and the report so amended.

The report of the committee was then adopted.

Mr. Parsons offered the following:

WHEREAS, The chairman of the Business Committee has for the past two years with great zeal and efficiency, performed the arduous duties devolved upon him, to the satisfaction of the Executive Committee, and all parties interested, therefore

Resolved, That we tender to him an expression of our cordial thanks, with our deep sense of the value of his services.

Resolved, That a special committee of three be named by the president to prepare some significant token of the permanent regard of this, the Executive Committee of the State Agricultural Society, to be tendered to Chairman Gilbert.

The resolution was unanimously adopted, and Messrs. Parsons, Ball, and Anderson appointed as such committee.

The President appointed the following Committee and Superintendents:

Business Committee—W. H. Cobb, A. O. Hyde, F. V. Smith.
General Superintendent—E. O. Humphrey.
Chief Marshal—A. O. Hyde.
Cattle—I. H. Butterfield, Jr.
Horses—F. V. Smith, G. W. Phillips.
Sheep—D. W. Howard.
Swine—John Lessiter.
Poultry—J. Q. A. Burrington.
Machinery and Miscellaneous—Wm. Chamberlain.
Fine Arts—C. A. Harrison, Philo Parsons.
Music—M. P. Anderson.
Needle and Fancy work and Children's Department—Minnie Brow.
Manufacturers—A. F. Wood.
Agricultural—J. L. Mitchell.
Farming Implements—H. O. Hanford and Abel Angel.
Dairy—F. L. Reed.
Vehicles—John Gilbert.
Bees, Honey, etc.—W. J. Baxter.
Forage—E. W. Rising.
Police—J. M. Sterling, Wm. Ball.
Gates and Gatekeepers—Wm. Ball, J. M. Sterling.

The Committee, on motion, adjourned till 9 o'clock Friday morning.

FIFTH DAY.

DETROIT, January 12th, 1883.

The Executive Committee resumed its session this morning, pursuant to adjournment.

President Fralick in the chair.

The roll was called and the following named members were present:

President Fralick, Treasurer Dean, Messrs. Sterling, Hanford, Ball, Lessiter, Cobb, Mitchell, Hyde, Reed, Smith, Burrington, Wood, Chamberlain, Angel, Howard, Harrison, Butterfield, Anderson, and the Secretary.

On motion the proceedings of the meeting were approved as printed in the Journal.

The Committee then took a recess till 3 o'clock.

The Committee was called to order at 3 P. M., by President Fralick.

Mr Parsons offered the following, which was adopted unanimously:

Resolved, That the thanks of the Executive Committee of the State Agricultural Society be, and they are hereby tendered to Messrs. Hiram Walker & Sons, for their very courteous invitation to visit their extensive farms and view their fine stock.

Resolved, That we have pleasure in congratulating the Messrs. Walker on the high character of the stock in cattle, horses and swine, on the practical manner in which they are handled by Mr. Swan, and the benefits which must accrue to the community from their energy and enterprise in this direction, and we wish them all pecuniary success in their endeavors to improve the stock of the country.

The Secretary read a communication from Messrs. Montgomery & Westfall, claiming premium in Class 27, Division C. The matter was, on motion, referred to Mr. D. W. Howard, Superintendent of that Department.

The Committee then adjourned *sine die*.

HENRY FRALICK, *President*.

J. C. STERLING, *Secretary*.

OFFICIAL LIST OF PREMIUMS AWARDED AT THE THIRTY-FOURTH ANNUAL FAIR OF THE SOCIETY, HELD AT JACKSON, SEPTEMBER 18 TO 22, 1882.

DIVISION A—CATTLE.

CLASS 1—SHORT-HORNS.

Best bull, four years old or over, L. W. & O. Barnes, Byron	$25 00
2d do., D. McOmber, Hastings	20 00
3d do., George W. Tufts, Eaton Rapids	15 00
4th do., Edward Upton, Leslie	10 00
Best bull, three years old, Phelps Bros., Dexter	20 00
2d do., L. L. Brooks, Novi	15 00
3d do., John Lessiter, Jersey	10 00
Best bull, two years old, William Ball, Hamburg	20 00
2d do., A. P. Cook, Brooklyn	15 00
3d do., H. K. Billings, Concord	10 00
Best bull, one year old, H. H. Hinds, Stanton	15 00
2d do., A. S. Brooks, Wixom	10 00
3d do., J. V. N. Gregory, Dexter	5 00
4th do., A. F. Wood, Mason	3 00
Best bull calf, over six months, Frank Wilson, Jackson	6 00
2d do., William Ball, Hamburg	5 00
3d do., John Lesseter, Jersey	2 50
4th do., H. H. Hinds, Stanton	1 50
Best bull calf under six months, Phelps Bros., Dexter	6 00
2d do., H. H. Hinds, Stanton	4 00
3d do., A. S. Brooks, Wixom	2 50
4th do., H. H. Hinds, Stanton	1 50
Best cow, four years old or over, Wm. Ball, Hamburg	25 00
2d do., A. S. Brooks, Wixom	20 00
3d do., Phelps Bros., Dexter	15 00
4th do., A. F. Wood, Mason	10 00

Best heifer, three years old, A. F. Wood, Mason	$20 00
2d do., A. S. Brooks, Wixom	15 00
3d do., A. S. Brooks, Wixom	10 00
4th do., A. P. Cook, Brooklyn	5 00
Best heifer, two years old, Wm. Ball, Hamburg	20 00
2d do., A. F. Wood, Mason	15 00
3d do., John Lessiter, Jersey	10 00
4th do., C. S. Brooks, Brighton	5 00
Best heifer, one year old, A. S. Brooks, Wixom	15 00
2d do., A. F. Wood, Mason	10 00
3d do., Phelps Bros., Dexter	5 00
4th do., J. V. W. Gregory, Dexter	3 00
Best heifer calf over six months, Wm. Ball, Hamburg	6 00
2d do., A. F. Wood, Mason	4 00
3d do., L. L. Brooks, Novi	2 50
4th do., D. McOmber, Hastings	1 50
Best heifer calf under six months, George W. Tufts, Eaton Rapids	6 00
2d do., H. H. Hinds, Stanton	4 00
3d do., A. S. Brooks, Wixom	2 50
4th do., A. P. Cook, Brooklyn	1 50

F. HART SMITH,
E. W. CADY,
THOS. BIRKETT,
Viewing Committee.

CLASS 2—DEVONS.

Best bull, four years old or over, E. T. Doney, Jackson	$25 00
2d do., J. J. Scurff & Son, New Carlisle, Ohio	20 00
Best bull, three years old, Leech & Walker, Utica	20 00
2d do., A. J. Burrows, Troy	15 00
Best bull, two years old, A. J. Burrows, Troy	20 00
bull, one year old, Leech & Walker, Utica	15 00
2d do., J. J. Scurff & Son, New Carlisle, Ohio	10 00
Best bull calf over six months old, A. J. Burrows, Troy	6 00
bull calf under six months old, J. J. Scurff & Son, New Carlisle, Ohio	6 00
2d do., Leech & Walker, Utica	4 00
3d do., A. J. Burrows, Troy	2 50
Best cow, four years old or over, J. J. Scurff & Son, New Carlisle, Ohio	25 00
2d do., Leech & Walker, Utica	20 00
3d do., A. J. Burrows, Troy	15 00
Best heifer, three years old, Leech & Walker, Utica	20 00
2d do., A. J. Burrows, Troy	15 00
3d do., Leech & Walker, Utica	10 00
Best heifer, two years old, J. J. Scurff & Son, New Carlisle, Ohio	20 00
2d do., Leech & Walker, Utica	15 00
3d do., E. T. Doney, Jackson	10 00
Best heifer, one year old, Leech & Walker, Utica	15 00
2d do., Leech & Walker, Utica	10 00
3d do., Leech & Walker, Utica	5 00
Best heifer calf, over six months old, Leech & Walker	6 00
2d do., E. T. Doney, Jackson	4 00
Best heifer calf under six months old, Leech & Walker, Utica	6 00
2d do., J. J. Scurff & Son, New Carlisle, Ohio	4 00
3d do., Leech & Walker, Utica	2 50

GEO. W. PHILLIPS,
EDWIN PHELPS,
WM. JENNEY,
Viewing Committee.

CLASS 4—AYRSHIRES.

Best bull, four years old or over, T. E. Wight, Millbury, Ohio	$25 00
bull, three years old, Wm. Fairweather, McLean, Penn.	20 00
2d do., Michigan Military Academy, Orchard Lake	15 00
Best bull, one year old, Wm. Fairweather, McLean, Penn.	15 00
2d do., T. E. Wight, Millbury, O.	10 00
3d do., A. Emmonds, Hastings	5 00

Best bull calf, over six months old, Michigan Military Academy, Orchard Lake	$6 00
Best bull calf, under six months old, T. E. Wight, Milbury, O	6 00
2d do., Wm. Fairweather, McLean, Penn	4 00
Best cow, four years old or over, William Fairweather	25 00
2d do., Michigan Military Academy, Orchard Lake	20 00
3d do., Wm. Fairweather, McLean, Penn	15 00
Best cow three years old, T. E. Wight, Millbury, O	20 00
2d do., Wm. Fairweather, McLean, Penn	15 00
3d do., Michigan Military Academy, Orchard Lake	10 00
Best heifer, two years old, T. E. Wight, Millbury, O	20 00
2d do., Michigan Military Academy, Orchard Lake	15 00
3d do., Wm. Fairweather, McLean, Penn	10 00
Best heifer, one year old, T. E. Wight, Millbury, O	15 00
2d do., Michigan Military Academy, Orchard Lake	10 00
3d do., A. Emmonds, Hastings	5 00
Best heifer calf, over six months old, Michigan Military Academy, Orchard Lake	6 00
Best heifer calf, under six months, T. E. Wight, Millbury, O	6 00
2d do., Wm. Fairweather, McLean, Penn	4 00
3d do., Michigan Military Academy, Orchard Lake	2 50

W. J. G. DEAN,
H. LONGWORTHY,
W. A. ROWLEY,
Viewing Committee.

CLASS 5—JERSEYS.

Best bull, four years old or over, N. Pinney & Co., Worthington, O	$25 00
2d do., Isaac Marston, Bay City	20 00
Best bull three years old, W. J. G. Dean, Hanover	20 00
bull two years old, H. R. Kingman, Battle Creek	20 00
2d do., N. Pinney & Co., Worthington, O	15 00
3d do.,,Charles Bassett, Adrian	10 00
Best bull, one year old, Isaac Marston, Bay City	15 00
2d do, W. J, G. Dean, Hanover	10 00
3d do., N. Pinney & Co., Worthington, O	5 00
Best bull calf, over six months old, N. Pinney & Co., Worthington, O	6 00
2d do., W. J. G. Dean, Hanover	4 00
3d do., H. R. Kingman, Battle Creek	2 50
Best bull calf, under six months old, W. J. Dean, Hanover	6 00
2d do., N. Pinney & Co., Wellington, O	4 00
Best cow, four years old or over, Isaac Marston, Bay City	25 00
2d do., W. J. G. Dean, Hanover	20 00
3d do., H. R. Kingman, Battle Creek	15 00
Best heifer, three years old, N. Pinney & Co., Wellington, O	20 00
2d do., H. R. Kingman, Battle Creek	15 00
3d do., H. R. Kingman, Battle Creek	10 00
Best heifer, two years old, W. J. G. Dean, Hanover	20 00
2d do., Isaac Marston, Bay City	15 00
3d do., N. Pinney & Co., Wellington, O	10 00
Best heifer, one year old, W. J. G. Dean, Hanover	15 00
2d do., Isaac Marston, Bay City	10 00
3d do., H. R. Kingman, Battle Creek	5 00
Best heifer calf, over six months old, W. J. G. Dean, Hanover	6 00
heifer calf, under six months old, W. J. G. Dean, Hanover	6 00
2d do., Isaac Marston, Bay City	4 00
3d do., N. Pinney & Co., Wellington, O	2 50

LOUIS BRUSH, *Judge.*

CLASS 6—GALLOWAYS AND POLLED ANGUS.

Best bull, four years old or over, S. A. Brown, Pentwater	$25 00
bull, one year old or over, S. A. Brown, Pentwater	15 00
Best bull calf, under one year old, R. B. Caruss, St. Johns	6 00
2d do., S. A. Brown, Pentwater	4 00
Best cow, four years old or over, R. B. Caruss, St. Johns	25 00
2d do., S. A. Brown, Pentwater	20 00
3d do., R. B. Caruss, St. Johns	15 00

Best heifer, three years old, R. B. Caruss, St. Johns	$20 00
2d do., S. A. Brown, Pentwater	15 00
3d do., R. B. Caruss, St. Johns	10 00
Best heifer, two years old, R. B. Caruss, St. Johns	20 00
2d do., S. A. Brown, Pentwater	15 00
3d do., S. A. Brown, Pentwater	10 00
Best heifer, one year old, R. B. Caruss, St. Johns	15 00
2d do., R. B. Caruss, St. Johns	10 00
Best heifer calf, over six months old, R. B. Caruss, St. Johns	6 00
heifer calf, under six months old, R. B. Caruss, St. Johns	6 00

E. M. CADY,
F. HART SMITH,
Viewing Committee.

CLASS 7—HOLSTEINS AND DUTCH FRIESIANS.

Best bull, four years old or over, Unadilla Valley S. B. Association, West Edmeston, N. Y.	$25 00
2d do., M. S. Sweet, Grand Rapids	20 00
3d do, Phelps & Seeley, North Farmington	15 00
Best bull, three years old, Wm. A. Rowley, Mt. Clemens	20 00
2d do., Ogden Cole, Rollin	15 00
Best bull, two years old, W. K. Sexton, Howell	20 00
2d do., Bruce Phillips, Utica	15 00
3d do., Smalley Bros., Concord	10 00
Best bull, one year old, 3d do., Stone & Biggs, Hastings	15 00
2d do., Phelps & Seeley, North Farmington	10 00
3d do., John Powers, Homer	5 00
Best bull calf over six months, Phelps & Seeley, North Farmington	6 00
2d do., Henry McNary, West Le Roy	4 00
3d do., J. S. Clusk & Son, Clinton	2 50
Best bull calf under six months old, Stone & Biggs, Hastings,	6 00
2d do., Smalley Bros., Concord	4 00
3d do., Smalley Bros., Concord	2 50
Best cow, four years old or over, W. K. Sexton, Howell	25 00
2d do., Unadilla Valley S. B. Association, West Edmeston, N. Y.	20 00
3d do., Phelps & Seeley, North Farmington	15 00
Best heifer three years old, Unadilla Valley S. B. Association, West Edmeston, N. Y.	20 00
2d do., Wm. A. Rowley, Mt. Clemens	15 00
3d do., Smalley Bros., Concord	10 00
Best heifer, two years old, Phelps & Seeley, North Farmington	20 00
2d do., Unadilla Valley S. B. Association, West Edmeston, N. Y.	15 00
3d do., Ogden Cole, Rollin	10 00
Best heifer one year old, Unadilla Valley S. B. Association, West Edmeston, N. Y.	15 00
2d do., Stone & Biggs, Hastings	10 00
3d do., W. A. Rowley, Mt. Clemens	5 00
Best heifer calf over six months, Smalley Bros., Concord	6 00
2d do., Phelps & Seeley, North Farmington	4 00
3d do., Unadilla Valley S. B. Association, West Edmeston, N. Y.	2 50
Best heifer calf under six months old, Unadilla Valley S. B. Association, West Edmeston, N. Y.	3 00
2d do., Phelps & Seeley, North Farmington	4 00
3d do., Ogden Cole, Rollin	2 50

ISAAC MARSTON,
LOUIS BRUSH,
SAMUEL JOHNSON,
Viewing Committee.

CLASS 8—GRADE CATTLE.

Best cow, four years old or over, Daniel Miller, Clarkston	$25 00
2d do., A. Hosner, North Farmington	20 00
3d do., David Miller, Clarkston	15 00
4th do., Frank Townly, E. Springport	10 00

Best heifer, three years old, A. Hosner, N. Farmington	$20 00
2d do., A. F. Wood, Mason	15 00
3d do., David Miller, Clarkston	10 00
4th do., David Miller, Clarkston	5 00
Best heifer two years old, A. Hosner, N. Farmington	20 00
2d do., A. Hosner, N. Farmington	15 00
3d do., David Miller, Clarkston	10 00
4th do., David Miller, Clarkston	5 00
Best heifer one year old, A. P. Cook, Brooklyn	15 00
2d do., A. Hosner, N. Farmington	10 00
3d do., David Miller, Clarkston	5 00
4th do., A. Hosner, N. Farmington	3 00
Best heifer calf, Edward Upton, Leslie	12 00
2d do., A. Hosner, N. Farmington	8 00
3d do., David Miller, Clarkston	5 00
4th do., Chas. Basset, Adrian	3 00

L. L. BROOKS,
W. E. BOYDEN,
DAVID CLARK,
Viewing Committee.

CLASS 9—WORKING OXEN AND STEERS.

Best yoke of working oxen, over five years old, A. Hosner, N. Farmington	$25 00
2d do., E. T. Doney, Jackson	20 00
Best yoke of steers four years old, A. Smith, Jackson	20 00
2d do., David Miller, Clarkston	15 00
Best yoke of steers two years old, Oscar Cline, Sherwood	10 00
Best yoke of steers one year old, Amos F. Wood, Mason	8 00
2d do., David Miller, Clarkston	5 00

L. L. BROOKS,
W. E. BOYDEN,
DAVID CLARK,
Viewing Committee.

CLASS 10—FAT CATTLE.

Best steer three years old, A. Hosner, N. Farmington	$12 00
2d do., A. Hosner, N. Farmington	8 00
Best steer two years old, A. Hosner, N. Farmington	10 00
Best steer one year old, A. Hosner, N. Farmington	8 00
2d do., A. Hosner, N. Farmington	5 00
3d do., Frank Townley, E. Springport	3 00
Best heifer three years old, A. Hosner, N. Farmington	15 00
2d do.. H. W. Rilly, Greenville	8 00
3d do., A. S. Brooks, Wixom	4 00
Best heifer two years old, A. Hosner, N. Farmington	10 00
Best herd of fat cattle, A. Hosner, N. Farmington	25 00
Best steer showing greatest weight for age in days, one year old and under four years, Frank Townley, E. Springport	20 00
2d do., E. Upton, Leslie	12 00

CLASS 11—HERDS.

Best herd of Shorthorns, Wm. Ball, Hamburg	$30 00
2d do., Phelps Bros., Dexter	25 00
3d do., A. F. Wood, Mason	20 00
4th do,, L. L. Brooks, Novi	15 00
5th do., A. S. Brooks, Wixom	10 00

F. H. SMITH,
LOUIS BRUSH,
W. H. MILLER,
Viewing Committee.

Best herd of Devons, J. J. Scharff & Son, New Carlisle, Ohio	$25 00
2d do., A. J. Burrows, Troy	15 00
3d do., Leech & Walker, Utica	10 00

F. H. SMITH,
W. H. MILLER,
WILLIAM KEITH,
Viewing Committee.

Best herd of Ayrshires, T. E. Wight, Millbury, O.	$25 00
2d do., Wm. Fairweather, McLean, Pa.	15 00
3d do., Michigan Military Academy, Orchard Lake	10 00

W. J. G. DEAN,
H. LANGWORTHEY,
W. A. ROWLEY,
Viewing Committee.

Best herd of Jerseys, H. R. Kingman, Battle Creek	$25 00
2d do., N. Pinney & Co., Worthington, Ohio	15 00
3d do., Isaac Marston, Bay City	10 00
Best herd of Galloways, S. A. Brown, Pentwater	25 00
Best herd of Holsteins, Unadilla Valley, S. B. Ass'n, W. Edmeston, N. Y.	25 00
2d do., Phelps & Seeley, N. Farmington	15 00
3d do., W. K. Sexton, Howell	10 00

ISAAC MARSTON,
SAM'L JOHNSON,
LOUIS BRUSH,

Best herd of Guernseys, C. H. Gibbs, Pontiac	$25 00

DIVISION B—HORSES.

CLASS 12—THOROUGHBREDS.

Best mare, four years old or over, without colt, Edmund Harwood, Leslie	$15 00
2d do., L. W. Mellen, Colon	12 00
Best filly one year old, F. L. Millsen, Colon	7 00

B. VOSBURG,
B. F. RANSOM.
Viewing Committee.

CLASS 13—HORSES OF ALL WORK.

Best stallion, five years old or over, Ed. H. Lyon, St. Johns	$25 00
2d do., Wm. Harris, Napoleon	20 00
2d do., R. J. Hart, Lapeer	15 00
4th do., G. S. May, Unadilla	10 00
Best stallion, four years old, C. A. Dayis, Albion	20 00
2d do., D. McOmber, Hastings	15 00
Best stallion, three years old, J. C. Deyo, Jackson	20 00
2d do., Henry Haynes, Leoni	15 00
3d do., David Plownau, Detroit	10 00
Best stallion, two years old, L. M. Lyon, St. Johns	12 00
Best stallion, one year old, Uri Isbell, Stockbridge	10 00
2d do., Mitchell & Boulton, Leslie	8 00
3d do., L. B. Kerr, Somerset Center	5 00
Best stallion colt, A. B. Cook, South Riley	8 00
2d do., Charles Travis, St. Johns	5 00
3d do., D. M. Osborn, Hastings	3 00
Best brood mare, four years old or over, with colt, J. C. Chilson, Livonia	20 00
2d do., A. B. Cook, South Riley	15 00
3d do., Chas. Travis, St. Johns	10 00
4th do., J. D. Perry, Redford	5 00
Best mare four years old or over, without colt, H. H. Tucker, Concord	12 00
2d do., A. A. Strong, Grass Lake	8 00
3d do., Benj. Miller, South Riley	5 00
Best mare three years old, A. Strong, Grass Lake	10 00
2d do., B. O. Taggert, Romeo	8 00
3d do., D. McOmber, Hastings	4 00

Best filly two years old, C. A. Davis, Albion	$8 00
2d do., Samuel Shafer, Liberty	5 00
3d do., Ben. Miller, South Riley	3 00
Best filly one year old, Henry Crouch, Jackson	7 00
2d do., Henry Crouch, Jackson	5 00
Best filly colt, Chas. Travis, St. Johns	5 00
2d do., A. Strong, Grass Lake	3 00
3d do., J. C. Chilson, Livonia	2 00
Best gelding five years old or over, J. C. Deyo, Jackson	15 00
2d do., F. A. & M. L. Ray, Concord	10 00
3d do., C. W. Riggs, Francisco	5 00
Best gelding four years old, John Powers, Homer	12 00
2d do., Louis Pike, Jackson	8 00
3d do., S. S. Vaugher	5 00
Best gelding three years old, A. Beller, Leoni	10 00
2d do., J. D. Perry, Redford	8 00
3d do., James Newberry, Hanover	5 00
Best gelding two years old, C. A. Davis, Albion	8 00
2d do., W. W. Nichol, Jr., Jackson	5 00
Best gelding one year old, M. H. Ray, Concord	6 00
Best pair matched horses five years old or over, Jas. C. Deyo, Jackson	30 00
2d do., L. Kinney, Albion	20 00
3d do., Morris Knapp, Jackson	10 00
Best pair matched horses four years old, S. S. Vaughn, Jackson	25 00
2d do., Davenport, Smith & Curtis, Grass Lake	15 00
3d do., C. Bassett, Adrian	10 00
Best pair matched horses three years old, James Wescott, North Adams	15 00

C. E. MORRISON,
WM. BAIR,
ORIN SNOW,
Viewing Committee.

CLASS 14—ROADSTERS.

Best stallion, five years old or over, S. A. Brown, Pentwater	$30 00
2d do., J. C. Deyo, Jackson	20 00
3d do., B. D. Taggert, Romeo	10 00
Best stallion, four years old, James Osborn, Tekonsha	25 00
2d do., R. G. Hart, Lapeer	15 00
Best stallion, three years old, A. C. Fisk, Coldwater	20 00
2d do., A. S. Wixom, Coldwater	15 00
Best gelding, five years old or over, R. G. Hart, Lapeer	15 00
2d do., D. N. Tripp, Coldwater	10 00
3d do., Henry Darrow, Homer	5 00
Best gelding, four years old, Louis Pike, Jackson	12 00
2d do., H. R. Baker, Jonesville	8 00
3d do., Chas. Smith, Leoni	4 00
Second best gelding, three years old, S. A. Brown, Pentwater	6 00
3d do., Henry Darrow, Homer	4 00
Best mare, three years old, A. S. Wixom, Coldwater	10 00
2d do., W. W. Pease, Marshall	6 00

B. VOSBURG,
B. F. RANSOM,
C. B. HAWLEY,
Viewing Committee.

CLASS 15—BREEDERS' STOCK.

Best stallion, two years old, A. C. Fisk, Coldwater	$12 00
2d do., E. H. Lyons, St. Johns	8 00
3d do., F. H. Starkey, Fowlerville	5 00
Best stallion, one year old, S. A. Brown, Pentwater	10 00
2d do., S. A. Brown, Pentwater	6 00
3d do. J. A. Robinson, Jackson	4 00
Best stallon colt, S. A. Brown, Pentwater	7 00
2d do., E. T. Doney, Jackson	5 00
3d do., R. D. Jackson, Jackson	3 00

Best gelding, two years old, Clark Allen, Blackman	$8 00
2d do., R. D. Jackson, Jackson	5 00
Best gelding, one year old, John Tobin, Jackson	6 00
2d do., M. H. Ray, Concord	4 00
Best mare, four years old or over, S. A. Brown, Pentwater	20 00
2d do., Nelson Eldred, Battle Creek	15 00
3d do., Stephen Osborn, Hillsdale	10 00
Best mare, two years old, S. A. Brown, Pentwater	8 00
2d do., S. A. Brown, Pentwater	5 00
3d do., F. Hawley, Horton	3 00
Best mare, one year old, H. C. Hoag, Mendon	7 00
2d do., S. A. Brown, Pentwater	5 00
3d do., J. G. Carter, Jackson	2 00
Best mare colt, Dr. W. A. Gibson, Jackson	5 00
2d do., Dr. W. A. Gibson, Jackson	3 00
3d do., C. A. Davis, Albion	2 00

C. C. MORRISON,
WM. BAIR,
ORIN SNOW,
Viewing Committee.

CLASS 16—GENTS' DRIVING HORSES.

Second best pair gents' driving horses, Jno. Saulsbury, Seneca	$20 00
Best gelding or mare, five years old, C. C. Pond, Jackson	30 00
2d do., E. Van Valkenburg, Hillsdale	20 00
3d do., Davenport, Smith & Curtis, Grass Lake	10 00
Best mare, four years old, S. S. Vaughn, Jackson	20 00
2d do., J. C. Blake, Tekonsha	15 00
3d do., S. A. Brown, Pentwater	10 00

B. VOSBURG,
B. F. RANSOM,
H. B. HAWLEY,
Viewing Committee.

CLASS 17—DRAUGHT HORSES.

Best stallion, five years old or over, G. G. Hartong, Romeo	$30 00
2d do., M. W. Barker & Son, Battle Creek	20 00
3d do., Crumpacker, Winters & Co., Westville, Ind	10 00
Best stallion, four years old, Mitchell & Bolton, Leslie	25 00
2d do., E. B. Green, Olivet	15 00
3d do., H. R. Kingman, Battle Creek	10 00
Best stallion, three years old, Crumpacker, Winters & Co., Westville, Ind.	20 00
2d do., Frank Burnett, Union City	12 00
3d do., D. McOmber, Hastings	8 00
Best stallion, one year old, Henry Crouch, Jackson	8 00
2d do., Mitchell & Bolton, Leslie	5 00
Best stallion colt, A. Philips, Dansville	5 00
2d do., A. Phillips, Dansville	3 00
Best mare, four years old or over, Crumpacker, Winters & Co., Westville, Ind	20 00
2d do., A. Philips, Dansville	12 00
3d do., A. Philips, Dansville	8 00
Best mare, two years old, C. A. Davis, Albion	10 00
Best mare, one year old, Crumpacker, Winters & Co., Westville, Ind	8 00
2d do., Milton Reed, Jackson	5 00
3d do., Milton Reed, Jackson	3 00
Second best filly colt, Milton Reed, Jackson	3 00

C. E. MORRISON,
WM. BAIR,
ORIN SNOW,
Viewing Committee.

CLASS 18—CARRIAGE AND BUGGY HORSES.

Best pair of carriage matched horses, sixteen hands and five years old or over, C. C. Pond, Jackson	$30 00
2d do., Morris Knapp, Jackson	20 00
3d do., James C. Deyo, Jackson	10 00

Best pair of matched carriage horses, sixteen hand, four years old, James C. Deyo, Jackson	$25 00
2d do., E. A. Collins, Homer	15 00
3d do., Philo J. Hall, Jackson	10 00
Best pair of matched carriage horses, three years old, I. J. Nelson, Homer	20 00
2d do., W. S. Harris, Jackson	12 00
3d do., Ray Warren, Coldwater	8 00
Best gelding, four years old or over, J. G. Carter	12 00
2d do., S. S. Vaughn, Jackson	8 00
3d do., Henry Brown & Co., Battle Creek	4 00
Best carriage horse, three years old, S. S. Vaughn, Jackson	10 00
2d do., H. H. Tucker, Concord	7 00
3d do., I. Bentley, Jackson	3 00

B. VOSBURG,
B. F. RANSOM,
C. B. HAWLEY,
Viewing Committee.

CLASS 19—MICHIGAN HORSES, ROADSTERS AND THOROUGH-BREDS.

Best stallion, five years old or over, S. A. Brown, Pentwater	$100 00
2d do., Wm. Mellen, Colon	75 00
3d do., Dr. W. A. Gibson, Jackson	50 00
Best stallion, four years old, Mary L. Acker, Charlotte	75 00
2d do., Robert Goodwin, Colon	50 00
3d do., A. D. Pease, Marshall	25 00
Best stallion, three years old, Wm. Mellen, Colon	30 00
2d do., A. L. Wixson, Coldwater	20 00
3d do., A. H. Willard, Olivet	10 00
Best stallion, two years old, Barry & Fox, Constantine	20 00
2d do., A. C. Fisk, Coldwater	15 00

B. VOSBURG,
B. F. RANSOM,
H. B. HAWLEY,
Viewing Committee.

CLASS 20—MICHIGAN HORSES, MARES, AND GELDINGS.

Best gelding or mare five years old or over, Wm. Mellen, Colon	$100 00
2d do., J. C. Deyo, Jackson	75 00
3d do., Mart Axford, Mt. Clemens	50 00
Best gelding or mare four years old, Wm. Mellen, Colon	75 00
2d do., Barry & Fox, Constantine	50 00
3d do., A. C. Fisk, Coldwater	25 00
Best gelding or mare three years old, H. C. Hoag, Mendon	30 00
2d do., Clement Bros., Colon	20 00
3d do., G. F. Markham, Marshall	10 00
Best filly two years old, A. T. Short, Coldwater	20 00
2d do., Clement Bros., Colon	15 00
3d do., H. C. Hoag, Mendon	10 00

B. VOSBURG,
B. F. RANSOM,
C. B. HAWLEY,
Viewing Commitee.

CLASS 20½.—MICHIGAN HORSES, THOROUGHBRED STALLIONS, MARES, AND GELDINGS

Best stallion any age, Lewis H. Brockway, Saginaw City	$75 00
2d do., Chas. Burnham, Fulton	50 00
3d do., T. S. Millson, Colon	25 00
Best mare or gelding any age, Phillip Garvey, East Saginaw	50 00
2d do., L. W. Mellen, Colon	30 00
3d do., Chas. Burnham, Fulton	20 00

B. VOSBURG,
B. F. RANSOM,
C. B. HAWLEY,
Viewing Committee.

CLASS 21—SWEEPSTAKES FOR STALLIONS WITH SIX OF THEIR OWN GET.

Best all work stallion, with six of his get, Ed. H. Lyon, St. Johns	$25 00
Best roadster stallion, with six of his get, H. C. Hoag, Mendon	25 00
2d do., S. A. Brown, Pentwater	20 00
Best draught stallion, with six of his get, Cronch & Reed, Jackson	25 00

E. C. MORRISON,
WM. BAIR,
ORIN COLE,
Viewing Committee.

DIVISION C—SHEEP.

CLASS 22—THOROUGHBRED AMERICAN MERINO SHEEP.

Best ram three years old or over, Wm. Ball, Hamburg	$20 00
2d do., J. W. Newberry, Hanover	15 00
3d do., C. M. Fellows, Manchester	10 00
4th do., L. W. & O. Barnes, Byron	5 00
Best ram two years old, Van Gieson Bros., Clinton	20 00
2d do., J. S. Bamber, Highland	15 00
3d do., L. W. & O. Barnes, Byron	10 00
4th do., E. Kellogg, Oceola Center	5 00
Best ram one year old, Short & Hunter, Coldwater	15 00
2d do., Wm. Ball, Hamburg	12 00
3d do., F. C. Wood, Saline	8 00
4th do., J. S. Bamber, Highland	5 00
Best ram lamb, S. S. Brewster, Hanover	12 00
2d do., F. C. Wood, Saline	10 00
3d do., A. A. Wood, Saline	5 00
Best two ewes three years old or over, Wm. Ball, Hamburg	20 00
2d do., A. T. Short, Coldwater	15 00
3d do., Van Gieson Bros., Clinton	10 00
Best two ewes two years old, Wood & Kennedy, Saline	20 00
2d do., Wm. Ball, Hamburg	15 00
3d do., T. M. Southworth, Allen	10 00
Best two ewes one year old, A. T. Short, Coldwater	15 00
2d do., A. A. Wood, Saline	12 00
3d do., Wm. Ball, Hamburg	8 00
Best two ewe lambs, F. C. Wood, Saline	12 00
2d do., A. T. Short, Coldwater	10 00
3d do., A. A. Wood, Saline	5 00
Best ram and five of his get, C. M. Fellows, Manchester	15 00
2d do., A. A. & F. C. Wood, Saline	10 00
3d do., L. W. & O. Barnes, Byron	5 00

J. B. COBB,
R. B. CARUSS,
J. W. DEY,
Viewing Committee.

CLASS 23—FINE WOOL GRADES.

Best two ewes, three years old or over, J. H. Hood, Sharon	$15 00
2d do., L. W. & O. Barnes, Byron	10 00
3d do., F. H. Lyon, Eaton Rapids	5 00
Best two ewes, two years old, J. H. Hood, Sharon	12 00
2d do., J. S. Bamber, Highland	8 00
Best two ewes, one year old, J. S. Bamber, Highland	10 00
2d do., L. W. & O. Barnes, Byron	6 00
3d do., F. H. Lyon, Eaton Rapids	4 00
Best two ewe lambs, L. W. & O. Barnes, Byron	8 00
2d do., L. W. & O. Barnes, Byron	5 00
3d do., J. S. Bamber, Highland	3 00

J. B. COBB,
J. W. DEY,
T. P. SMITH,
Viewing Committee.

CLASS 24—SOUTHDOWNS.

Best ram, two years old or over, T. B. Bennington, La Porte, O	$15 00
2d do., John Lessiter, Jersey	10 00
3d do., Mrs. Ann Newton	6 00
Best ram, one year old, T. B. Bennington, La Porte, O	12 00
2d do., John Lessiter, Jersey	8 00
3d do., Mrs. Ann Newton, Pontiac	5 00
Best ram lamb, T. B. Bennington, La Porte, O	10 00
2d do., John Lessiter, Jersey	6 00
3d do., Mrs. Ann Newton, Pontiac	4 00
Best two ewes, two years old or over, T. B. Bennington, La Porte, O	15 00
2d do., John Lessiter, Jersey	10 00
3d do., Mrs. Ann Newton, Pontiac	6 00
Best two ewes, one year old, T. B. Bennington, La Porte, O	12 00
2d do., John Lessiter, Jersey	8 00
3d do., John Lessiter	5 00
Best two ewe lambs, John Lessiter, Jersey	10 00
2d do., T. B. Bennington, La Porte, O	6 00
3d do., John Lessiter, Jersey	4 00

G. HOWARD,
S. H. TODD,
J. F. RANDALL,
Viewing Committee.

CLASS 25.—ALL MIDDLE WOOL SHEEP, OTHER THAN SOUTHDOWNS.

Best ram, two years old or over, Mrs. Ann Newton, Pontiac	$15 00
2d do., Mason & Hubbard, Marshall	10 00
3d do., T. B. Bennington, La Porte, O	6 00
Best ram, one year old, T. B. Bennington, La Porte, O	12 00
2d do., Mason & Hubbard, Marshall	8 00
3d do., Geary Bros., London, Ont.	5 00
Best ram lamb, John Lessiter, Jersey	10 00
2d do., Mason & Hubbard, Marshall	6 00
3d do., Mrs. Ann Newton, Pontiac	4 00
Best two ewes, two years old or over, T. B. Bennington, La Porte, O	15 00
2d do., Mrs. Ann Newton, Pontiac	10 00
3d do., Geary Bros , London, Ont.	6 00
Best two ewes, one year old, Mason & Hubbard, Marshall	12 00
2d do., Geary Bros., London, Ont.	8 00
3d do., T. B. Bennington, La Porte, O	5 00
Best two ewe lambs, John Lessiter, Jersey	10 00
2d do., T. B. Bennington, La Porte, O	6 00
3d do., Mrs. Ann Newton, Pontiac	4 00

G. HOWARD,
S. H. TODD,
Viewing Committee.

CLASS 26—LEICESTERS.

Best ram, two years old or over, Mrs. Ann Newton, Pontiac	$15 00
2d do., A. F. Wood, Mason	10 00
3d do., A. F. Wood, Mason	6 00
Best ram, one year old, Mrs. Ann Newton, Pontiac	12 00
2d do., A. F. Wood, Mason	8 00
Best ram lamb, Mrs. Ann Newton, Pontiac	10 00
2d do., A, F. Wood, Mason	6 00
3d do., A. F. Wood, Mason	3 00
Best two ewes, two years old or over, Mrs. Ann Newton, Hontiac	15 00
2d do., A. F. Wood, Mason	10 00
3d do., A. F. Wood, Mason	6 00
Best two ewes, one year old, Mrs. Ann Newton, Pontiac	12 00
2d do., A. F. Wood, Mason	8 00
3d do., A. F. Wood, Mason	5 00
Best two ewe lambs, Mrs. Ann Newton, Pontiac	10 00
2d do., A. F. Wood, Mason	6 00
3d do., A. F. Wood, Mason	4 00

G. HOWARD,
S. H. TODD,
J. S. RANDALL,
Viewing Committee.

CLASS 27—COTSWOLDS AND OTHER LONG-WOOLED SHEEP.

Best ram, two years old or over, Geary Bros., London, Ont.	$15 00
2d do., Mrs. Ann Newton, Pontiac	10 00
3d do., Geary Bros., London, Ont.	6 00
Best ram, one year old, Geary Bros., London, Ont.	12 00
2d do., Mrs. Ann Newton, Pontiac	8 00
3d do., Mrs. Ann Newton, Pontiac	5 00
Best ram lamb, Montgomery & Westfall, Hillsdale	10 00
2d do., Montgomery & Westfall, Hillsdale	6 00
3d do., Frank Wilson, Jackson	4 00
Best two ewes, two years old or over, Geary Bros., London, Ont.	15 00
2d do., Mrs. Ann Newton, Pontiac	10 00
3d do., Frank Wilson, Jackson	6 00
Best two ewes, one year old, Mrs. Ann Newton, Pontiac	12 00
2d do., Geary Bros., London, Ont.	8 00
3d do., Frank Wilson, Jackson	5 00
Best two ewe lambs, Mrs. Ann Newton, Pontiac	10 00
2d do., Montgomery & Westfall, Hillsdale	6 00
3d do., Montgomery & Westfall, Hillsdale	4 00

G. HOWARD,
WM. WHITE,
S. H. TODD,
Viewing Committee.

CLASS 28—GRADE COARSE-WOOLED SHEEP.

Best two ewes, two years old or over, Mrs. Ann Newton, Pontiac	$12 00
2d do., Frank Wilson, Jackson	8 00
Best two ewes, one year old or over, Frank Wilson, Jackson	10 00
2d do., Mrs. Ann Newton, Pontiac	6 00
Best two ewe lambs, Mrs. Ann Newton, Pontiac	8 00

JOHN LESSITER,
S. H. TODD,
Viewing Committee.

CLASS 29—FAT SHEEP.

Best pen of middle-wooled sheep, T. B. Bennington, La Porte, Ohio	$12 00
2d do., Mrs. Ann Newton, Pontiac	8 00
3d do., John Lessiter, Jersey	5 00
Best pen long-wooled sheep, Mrs. Ann Newton, Pontiac	12 00
2d do., Frank Wilson, Jackson	8 00
3d do., Frank Wilson, Jackson	5 00
Best pen grade fat sheep, Frank Wilson, Jackson	12 00
2d do., Mrs. Ann Newton, Pontiac	8 00

G. HOWARD,
S. H. TODD,
Viewing Committee.

SPECIAL CLASS.

Merino ram and five ewes, Wm. Ball, Hamburg	Silver water pitcher.

E. W. HARDY,
GEO. S. PIERSON,
F. SPEARY,
Viewing Committee.

DIVISION D.—SWINE.

CLASS 30—BERKSHIRES.

Best boar, two years old or over, G. D. Boyse, Paw Paw	$12 00
2d do., R. P. Gustin, Bay City	8 00
3d do., Wm. N. Adams, Jackson	4 00
Best boar, one year old, R. P. Gustin, Bay City	10 00
2d do., J. C. Chilson, Livonia	6 00
3d do., M. Hebblethwaite, Berlinville, Ohio	3 00
Best boar, under one year old, M. Hebblethwaite, Berlinville, Ohio	8 00
2d do., R. P. Gustin, Bay City	5 00
3d do., D. F. Vickery, Charlotte	3 00
Best brood sow, two years old or over, G. D. Boyse, Paw Paw	12 00
2d do., G. D. Boyse, Paw Paw	8 00
3d do., J. C. Chilson, Livonia	4 00

Best brood sow, one year old, G. D. Boyse, Paw Paw	$10 00
2d do., G. D. Boyse, Paw Paw	6 00
3d do., M. Hebbelthwaite, Berlinville, Ohio	3 00
Best sow, under one year old, M. Hebbelthwaite, Berlinville, Ohio	8 00
2d do., Wm. A. Rowley, Mt. Clemens	5 00
3d do., M. Hebelthwaite, Berlinville, Ohio	3 00
Best pen of pigs, under six months old, J. C. Chelson, Livonia	8 00
2d do., M. Hebbelthwaite, Berlinville, Ohio	5 00
3d do., R. P. Gustin, Bay City	3 00
Best boar, any age, G. D. Boyse, Paw Paw	Diploma.

ESSEX.

Best boar, two years old or over, Frank Wilson, Jackson	$12 00
2d do., E. T. Doney, Jackson	8 00
Best boar, one year old, G. D. Boyse, Paw Paw	10 00
2d do., G. D. Boyse, Paw Paw	6 00
3d do., A. Chandler, Jerome	3 00
Best boar, under one year old, G. D. Boyse, Paw Paw	8 00
2d do., G. D. Boyse, Paw Paw	5 00
3d do., Frank Wilson, Jackson	3 00
Best brood sow, two years old or over, Frank Wilson, Jackson	12 00
2d do., F. A. & M. L. Ray, Concord	8 00
3d do., G. D. Boyse, Paw Paw	4 00
Best sow, one year old, G. D. Boyse, Paw Paw	10 00
2d do., F. A. & M. L. Ray, Concord	6 00
3d do., E. T. Doney, Jackson	3 00
Best sow, under one year old, E. T. Doney, Jackson	8 00
2d do., G. D. Boyse, Paw Paw	5 00
3d do., Frank Wilson, Jackson	3 00
Best pen of pigs, under six months old, G. D. Boyse, Paw Paw	8 00
2d do., Frank Wilson, Jackson	5 00
3d do., F. A. & M. L. Ray, Concord	3 00
Best boar, F. Wilson	Diploma.

SUFFOLKS AND SMALL YORKSHIRES.

Best boar, two years old or over, Frank Wilson, Jackson	$12 00
2d do., G. D. Boyse, Paw Paw	8 00
3d do., J. H. Pike, Greenville	4 00
Best boar, one year old, Frank Wilson, Jackson	10 00
2d do., J. H. Pike, Greenville	6 00
3d do., D. F. Vickery, Charlotte	3 00
Best boar, under one year old, Frank Wilson, Jackson	8 00
2d do., G. D. Boyse, Paw Paw	5 00
3d do., J. C. Chilson, Livonia	3 00
Best brood sow, two years old or over, G. D. Boyse, Paw Paw	12 00
2d do., Frank Wilson, Jackson	8 00
3d do., D. F. Vickery, Charlotte	4 00
Best brood sow, one year old, G. D. Boyse, Paw Paw	10 00
2d do., Frank Wilson, Jackson	6 00
3d do., D. F. Vickery, Charlotte	3 00
Best sow, under one year old, G. D. Boyse, Paw Paw	8 00
2d do., D. F. Vickery, Charlotte	5 00
3d do., Frank Wilson, Jackson	3 00
Best pen of pigs, under six months old, J. H. Pike, Greenville	8 00
2d do., Frank Wilson, Jackson	5 00
3d do., J. H. Pike, Greenville	3 00
Best boar, any age, Frank Wilson, Jackson	Diploma.

POLAND-CHINA.

Best boar, one year old, L. W. & O. Barns, Byron	$10 00
2d do., Bradford & Garis, Rochester Depot, Ohio	6 00
3d do., L. W. & O. Barns, Byron	3 00
Best boar, under one year old, Bradford & Garis, Rochester Depot, Ohio	8 00
2d do., S. H. Todd, Wakeman, Ohio	5 00
3d do., L. W. & O. Barns, Byron	3 00
Best brood sow, two years old or over, L. W. & O. Barnes, Byron	12 00
2d do., Bradford & Garis, Rochester Depot, Ohio	8 00

Best sow, one year old, Bradford & Garis, Rochester, Ohio	$10 00
2d do., Harrison & Haynes, Grass Lake	6 00
3d do., L. W. & O. Barns, Byron	3 00
Best sow under one year old, Bradford & Garis, Rochester Depot, Ohio	8 00
2d do., Bradford & Garis, Rochester Depot, Ohio	5 00
3d do., L. W. & O. Barns, Byron	3 00
Best pen of pigs under six months old, L. W. & O. Barns, Byron	8 00
2d do., Bradford & Garis, Rochester Depot, Ohio	5 00
3d do., S. H. Todd, Wakeman, O.	3 00
Best boar of any age, L. W. & O. Barns, Byron	Diploma.

CHESTER WHITE AND LARGE YORKSHIRE.

Best boar, two years old or over, Richardson & Reed, Jackson	$12 00
2d do., Richardson & Reed, Jackson	8 00
Best boar, one year old, J. H. Pike, Greenville	10 00
Best boar, under one year old, S. H. Todd, Wakeman, O.	8 00
2d do., Richardson & Reed, Jackson	5 00
3d do., Richardson & Reed, Jackson	3 00
Best brood sow, two years old or over, Richardson & Reed, Jackson	12 00
2d do., Richardson & Reed, Jackson	8 00
3d do., Richardson & Reed, Jackson	4 00
Best sow, one year old, Richardson Reed, Jackson	10 00
2d do., Richardson & Reed, Jackson	6 00
3d do., Richardson & Reed, Jackson	3 00
Best sow, under one year old. S. H. Todd, Wakeman, O.	8 00
2d do., Richardson & Reed, Jackson	5 00
3d do., S. H. Todd, Wakeman, Ohio	3 00
Best pen of pigs, under six months old, S. H. Todd, Wakeman, O.	8 00
2d do., Richardson & Reed, Jackson	3 00
3d do., S. H. Todd, Wakeman, O.	3 00
Best boar of any age, Richardson & Reed, Jackson	Diploma.

FAT HOGS.

Best fat hog, over one year old, D. F. Vickery, Charlotte	$10 00
2d do., Frank Wilson, Jackson	6 00
3d do., F. A. & M. L. Ray, Concord	3 00
Best fat hog, less than ten months old, D. F. Vickery, Charlotte	6 00
2d do., G. D. Boyse, Paw Paw	4 00
3d do., Frank Wilson, Jackson	2 00

J. F. FERGUSON,
E. McGUNEGHE,
Viewing Committee.

DIVISION E.—POULTRY.

CLASS 31—ASIATIC.

Best pair light brahma fowls, John Sweet, Ann Arbor	$2 00
2d do., H. F. Ford, Hastings	1 00
Best pair light brahmas, chicks, James Ball, Marshall	2 00
2d do., T. E. Wurst, Elyria, Ohio	1 00
Best pair dark brahmas, fowls, James Ball, Marshall	2 00
2d do., T. E. Wurst, Elyria, Ohio	1 00
Best pair dark brahmas, chicks, H. F. Ford, Hastings	2 00
2d do., James Ball, Marshall	1 00
Best pair buff cochins, fowls, Wm. S. Jones, Owosso	2 00
2d do., Geo. H. White, Marshall	1 00
Best pair buff cochins, chicks, Geo. H. White, Marshall	2 00
2d do., Wm. S. Jones, Owosso	1 00
Best pair partridge cochins, fowls, Wm. S. Jones, Owosso	2 00
2d do., Geo. H. White, Marshall	1 00
Best pair partridge cochins, chicks, Wm. S. Jones, Owosso	2 00
2d do., Wm. S. Jones, Owosso	1 00
Best pair white cochins, fowls, Ambrose Purchase, Auburn	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair white cochins, chicks, E. & F. Sites, North Dover, Ohio	2 00
2d do., Andrew Berger, Adrian	1 00

Best pair black cochins, fowls, Andrew Burger, Adrian	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair black cochins, chicks, James Ball, Marshall	2 00
2d do., Wm. Jones, Owosso	1 00

DORKING CLASS.

Best pair colored dorkings, fowls, E. & F. Sites, North Dover, Ohio	$2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair colored dorkings, chicks, E. & F. Sites, North Dover, Ohio	2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair white dorkings, fowls, H. F. Ford, Hastings	2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair white dorkings, chicks, H. F. Ford, Hastings	2 00
2d do., H. F. Ford, Hastings	1 00
Best pair dominique fowls, W. S. Jones, Owosso	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

AMERICAN CLASS.

Best pair plymouth rocks, fowls, W. W. Thompson, Homer	$2 00
2d do., James Ball, Marshall	1 00
Best pair plymouth rocks, chicks, S. E. Wurst, Elyra, Ohio	2 00
2d do., James Ball, Marshall	1 00

GAME CLASS.

Best pair black breasted red game fowls, E. & F. Sites, North Dover, O.	$2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair black breasted red game chicks, John Sweet, Ann Arbor	2 00
2d do., S. E. Wurst, Elyra, Ohio	1 00
Best pair duckwing game fowls, E. & F. Sites, North Dover, Ohio	2 00
2d do., S. E. Wurst, Elyra, Ohio	1 00
Best pair duckwing game chicks, E. & F. Sites, North Dover, Ohio	2 00
Best pair blue game chicks, John Sweet, Ann Arbor	2 00
2d do., S. E. Wurst, Elyra, Ohio	1 00

SPANISH CLASS.

Best pair black Spanish fowls, S. B. Wurst, Elyria, Ohio	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair black Spanish chicks, Andrew Berger, Adrian	2 00

LEGHORN CLASS.

Best pair white leghorn fowls, S. E. Wurst, Elyria, Ohio	$2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair white leghorn chicks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyra, Ohio	1 00
Best pair brown leghorn fowls, Ambrose Purchase, Auburn	2 00
2d do., W. W. Thompson, Homer	1 00
Best pair brown leghorn chicks, W. W. Thompson, Homer	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

POLISH CLASS.

Best pair black Polish fowls, S. E. Wurst, Elyria, Ohio	$2 00
2d do., Andrew Burger, Adrian	1 00
Best pair black Polish chicks, John Sweet, Ann Arbor	2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair white Polish fowls, E. & F. Sites, North Dover, Ohio	2 00
2d do., H. F. Ford, Hastings	1 00
Best pair white Polish chicks, James Ball, Marshall	2 00
2d do., J. K. Babcock, Hastings	1 00
Best pair silver Polish fowls, Ambrose Purchase, Auburn	2 00
2d do., J. K. Babcock, Hastings	1 00
Best pair silver Polish chicks, Ambrose Purchase, Auburn	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair golden Polish fowls, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00
Best pair golden Polish chicks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

FRENCH CLASS.

Best pair Crevecœur fowls, E. & F. Sites, North Dover, Ohio	$2 00
Best pair Houdan fowls, S. E. Wurst, Elyra, Ohio	2 00
2d do., H. F. Ford, Hastings	1 00
Best pair Houdan chicks, H. F. Ford, Hastings	2 00
2d do., Andrew Burger, Adrian	1 00

HAMBURG CLASS.

Best pair golden spangled Hamburg fowls, E. & F. Sites, North Dover, O.,	$2 00
Best pair golden spangled Hamburg chicks, J. K. Babcock, Hastings	2 00
2d do., J. K. Babcock, Hastings	1 00
Best pair silver spangled Hamburg fowls, H. F. Ford, Hastings	2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair silver spangled Hamburg chicks, M. H. Walworth, Kalamazoo	2 00
2d do., M. H. Walworth, Kalamazoo	1 00
Best pair brown Hamburg fowls, E. & F. Sites, North Dover, Ohio	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair brown Hamburg chicks, Wm. S. Jones, Owosso	2 00
Best pair black Hamburg fowls, E. & F. Sites, North Dover, Ohio	2 00
2d do., Wm. S. Jones, Owosso	1 00
Best pair black Hamburg chicks, Wm. S. Jones, Owosso	2 00

BANTAM CLASS.

Best pair black breasted red game bantam fowls, S. E. Wurst, Elyria, Ohio	$2 00
2d do., H. F. Ford, Hastings	1 00
Best pair black breasted red game bantam chicks, S. E. Wurst, Elyria, Ohio,	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair duck wing game bantam fowls, E. & F. Sites, North Dover, O.	2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair duck wing game bantam chicks, John Sweet, Ann Arbor	2 00
2d do., E. & F. Sites, North Dover, Ohio	1 00
Best pair silver laced seabright bantam fowls, L. Acker, Charlotte	2 00
2d do., Wm. S. Jones, Owosso	1 00
Best pair silver laced seabright bantam chicks, E. & F. Sites, North Dover, Ohio	2 00
2d do., Wm. S. Jones, Owosso	1 00
Best pair white bantam fowls, L. Acker, Charlotte	2 00
2d do., John Sweet, Ann Arbor	1 00
Best pair white bantam chicks, Wm. S. Jones, Owosso	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair gold laced seabright bantam fowls, L. Acker, Charlotte	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair gold laced seabright bantam chicks, S. E. Wurst, Elyria, Ohio	2 00
Best pair black African bantam fowls, S. E. Wurst, Elyria, Ohio	2 00
Best pair black African bantam chicks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

TURKEY CLASS.

Best pair bronze turkeys, S. E. Wurst, Elyria, Ohio	$2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair white turkeys, E. & F. Sites, North Dover, Ohio	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair buff turkeys, Ambrose Purchase, Auburn	2 00
Best pair slate turkeys, Ambrose Purchase, Auburn	2 00
Best pair pearl Guinea fowls, Ambrose Purchase, Auburn	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair white Guinea fowls, E. & F. Sites, North Dover, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

ORNAMENTAL.

Best pair peafowls, Ambrose Purchase, Auburn	$2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

GOOSE CLASS.

Best pair Toulouse geese, S. E. Wurst, Elyria, Ohio	$2 00
2d do., Rob. H. Wilson, Jackson	1 00

Best pair Bremen geese, Andrew Burger, Adrian	$2 00
Best pair dark Chinese geese, E. & F. Sites, North Dover, Ohio	2 00
Best pair white Chinese geese, S. E. Wurst, Elyria, Ohio	2 00
2d do., Ambrose Purchase, Auburn	1 00

DUCK CLASS.

Best pair Rouen ducks, E. & F. Sites, North Dover, Ohio	$2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00
Best pair Aylesbury ducks, S. E. Wurst, Elyria, Ohio	2 00
Best pair Cayuga ducks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00
Best pair Topknot ducks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00
Best pair Muscovy ducks, S. E. Wurst, Elyria, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00
Best pair Pekin docks, E. & F. Sites, North Dover, Ohio	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

RABBIT CLASS.

Best lop-eared rabbits, buck of any color, S. E. Wurst, Elyria, Ohio	$2 00
Best lop-eared rabbits, doe of any color, S. E. Wurst, Elyria, Ohio	2 00
2d do., Ambrose Purchase, Auburn	1 00
Best pair white silk-haired rabbits, W. W. Thompson, Homer	2 00
2d do., W. W. Thompson, Homer	1 00
Best pair common rabbits, W. N. Woodsum & Co., Jackson	2 00
2d do., S. E. Wurst, Elyria, Ohio	1 00

PIGEON CLASS.

Best collection of pigeons, S. E. Wurst, Elyria, Ohio	$5 00
2d do., H. F. Ford, Hastings	3 00

CAGED-BIRD CLASS.

Best pair Belgian canaries, Andrew Burger, Adrian	$2 00
Best pair German canaries, Andrew Burger, Adrian	2 00

MINOR PET CLASS.

Best pair Guinea pigs, S. E. Wurst, Elyria, Ohio	$2 00
Best pair white mice, S. E. Wurst, Elyria, Ohio	2 00
Best pair ferrets, S. E. Wurst, Elyria, Ohio	2 00

STUFFED BIRDS.

Best collection of stuffed birds, Stephen Mummery, Detroit	$10 00
Best collection of poultry, S. E. Wurst, Elyria, Ohio	15 00
2d do., E. & F. Sites, North Dover, Ohio	10 00

NON-ENUMERATED.

Best pair red pyle bantam fowls, L. Acker, Charlotte	$2 00
2d do., L. Acker, Charlotte	1 00
Best pair red pyle bantam chicks, L. Acker, Charlotte	1 00
Best pair Langham chickens, H. D. Cutting, Clinton	2 00
Best pair East India laughing doves, H. D. Cutting, Clinton	2 00
Pair Embden geese, Ambrose Purchase, Auburn	2 00
Pair buff geese, Ambrose Purchase, Auburn	2 00
Pair young buff geese, Ambrose Purchase, Auburn	1 00
Best pair black leghorn chicks, J. K. Babcock, Hastings	2 00
2d do., J. K. Babcock, Hastings	1 00
Best red pyle game fowls, John Sweet, Ann Arbor	2 00
Best red pyle game chicks, H. F. Ford, Hastings	2 00
Best pair Andalusian fowls, Andrew Burger, Adrian	2 00
Best pair Andalusian chicks, Andrew Burger, Adrian	2 00
2d do., Andrew Burger, Adrian	1 00
Best pair dominique leghorn fowls, Andrew Burger, Adrian	2 00
Best pair white rose leghorns, S. E. Wurst, Elyria, Ohio	2 00
Best pair white pyle game bantams, E. & F. Sites, North Dover, Ohio	2 00

S. W. CURTISS,
Judge.

DIVISION F.—FARM AND GARDEN PRODUCE.

CLASS 32—GRAIN AND SEEDS.

Best bushel winter red wheat, Martin Tanner, Jackson	$6 00
2d do., Frank Maxom, Summit	4 00
Best bushel winter white wheat, Albert Case, Manchester	6 00
2d do., Frank Wilson, Jackson	4 00
Best bushel spring wheat, R. M. Webster, Armada	5 00
Best bushel rye, D. Woodman, Paw Paw	5 00
2d do., Martin Tanner, Jackson	3 00
Best bushel four-rowed barley, D. Woodman, Paw Paw	5 00
2d do., Jno. F. Drew, Jackson	3 00
Best bushel of oats, Albert Case, Manchester	5 00
2d do., C. B. Westren, Henrietta	3 00
Best bushel winter barley, David Woodman, Paw Paw	5 00
Best bushel Dent corn, M. E. Bartlett, Tompkins	5 00
2d do., G. Van Houten, Grass Lake	3 00
Best bushel white Flint corn, H. Laberteaux, Bunker Hill	5 00
2d do., Martin Tanner, Jackson	3 00
Best bushel smut nose corn, C. C. Buckley, Leoni	5 00
2d do., J. D. Perry, Redford	3 00
Best bushel peas, Frank Wilson, Jackson	5 00
Best bushel white beans, R. M. Webster, Armada	5 00
2d do., Albert Case, Manchester	3 00
Best bushel large clover seed, D. L. Garver, Hart	5 00
2d do., Martin Tanner, Jackson	3 00
Best bushel small clover seed, Frank Wilson, Jackson	5 00
2d do., Martin Tanner, Jackson	3 00
Best bushel timothy seed, Martin Tanner, Jackson	5 00
2d do., D. N. Tripp, Coldwater	3 00
Best bushel buckwheat, Frank Wilson, Jackson	3 00
2d do., Albert Case, Manchester	2 00
Best bushel flax seed, Martin Tanner, Jackson	3 00
Best sample of hops, R. M. Webster, Armada	2 00
2d do., Martin Tanner, Jackson	1 00
Best assortment of seeds for field crops, D. Woodman, Paw Paw	10 00
Best display of grain in heads, D. Woodman, Paw Paw	10 00
2d do., Mrs. D. A. Ramsey, Jackson	5 00
Best display of grain in heads, with stool and roots, D. Woodman, Paw Paw	10 00
Best display of corn in ear, C. W. Riggs, Francisco	10 00
2d do., P. Knauf, Francisco	5 00
Best display of grasses in stalk and head, M. E. Bartlett, Tompkins	10 00
2d do., D. Woodman, Paw Paw	5 00

JOHN O'BRINE,
F. M. BOSWORTH,
A. G. GULLEY,
Viewing Committee.

CLASS 33—ROOTS AND VEGETABLES.

Best collection of ten varieties of potatoes, B. F. Wood, Concord	$10 00
2d do., John R. Ford, Jackson	8 00
3d do., W. H. Overholt, Mason	5 00
Best sample peck seedling potatoes, W. H. Overholt, Mason	3 00
Best three varieties early potatoes, W. H. Overholt, Mason	3 00
2d do., Stephen Marx, Detroit	2 00
Best three varieties late potatoes, W. H. Overholt, Mason	3 00
2d do., Jno. R. Ford, Jackson	2 00
Best sample peck early potatoes, Isaac Storm, Jackson	3 00
2d do., Stephen Marx, Detroit	2 00
Best sample peck late potatoes, G. Van Houten, Grass Lake	3 00
2d do., D. B. Peck, Jackson	2 00
Best dozen blood beets, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen turnip beets, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00

Best dozen sugar beets, C. M. Hubbell, Ypsilanti	$2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen white beets, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen table beets, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best collection of beets, Stephen Marx, Detroit	3 00
Best dozen mangel wurtzel, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen orange carrots, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen white carrots, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen any variety of carrots, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best collection of carrots, Stephen Marx, Detroit	3 00
Best dozen flat turnips, Stephen Marx, Detroit	2 00
Best dozen sweet turnips, C. M. Hubbell, Ypsilanti	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen snow-ball turnips, L. C. Lincoln, Greenville	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen parsnips, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen salsify, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen winter radishes, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best dozen or more summer radishes, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best collection of radishes, Stephen Marx, Detroit	3 00
Best and greatest variety of culinary vegetables, Stephen Marx, Detroit	5 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Best four heads cone head cabbage, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best four heads Savoy cabbage, Stephen Marx, Detroit	2 00
Best four heads red cabbage, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best collection of cabbage, Stephen Marx, Detroit	3 00
Best four heads of cauliflower, Stephen Marx, Detroit	2 00
Best six heads of lettuce, Stephen Marx, Detroit	2 00
Best six bunches kale, Stephen Marx, Detroit	2 00
Best dozen stems bleached celery, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen stems rhubarb, Stephen Marx, Detroit	2 00
2d do., P. C. Peck, Jackson	1 00
Best six vegetable eggs, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best dozen peppers, C. M. Hubbell, Ypsilanti	2 00
2d do., L. Lincoln, Greenville	1 00
Best three varieties of tomatoes, C. M. Hubbell, Ypsilanti	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best peck any variety tomatoes, C. M. Hubbell	2 00
2d do., Stephen Marx, Detroit	1 00
Best peck white onions, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best peck red onions, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best peck yellow onions, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best collection of onions, Stephen Marx, Detroit	3 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Best five summer squash, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best five marrow squash, C. M. Hubbell, Ypsilanti	2 00
2d do., W. H. [illegible]	1 00

Best five Hubbard squash, C. M. Hubbell, Ypsilanti	$2 00
2d do., Stephen Marx, Detroit	1 00
Best single squash, C. M. Hubbell, Ypsilanti	2 00
2d do., Frank Maxon, Jackson	1 00
Best collection of squash, Stephen Marx, Detroit	3 00
Best two sweet pumpkins, J. W. Helm, Adrian	2 00
Best two field pumpkins, M. E. Bartlett, Tompkins	2 00
Best three water melons, C. M. Hubbell, Ypsilanti	2 00
2d do., E. Ellis, Grass Lake	1 00
Best three musk melons, E. Ellis, Grass Lake	2 00
Best three nutmeg melons, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best three citrons, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00
Best five cucumbers, C. M. Hubbell, Ypsilanti	2 00
2d do., Martin Tanner, Jackson	1 00
Best half peck Lima beans, Warren Case, Napoleon	2 00
Best half peck bush beans, W. H. Overholt, Mason	2 00
2d do., Mrs. D. H. Ranney, Jackson	1 00
Best peck wax beans, Warren Case, Napoleon	2 00
2d do., Miss Gusta McClarey, Galesburg	1 00
Best dozen ears early sweet corn, C. W. Riggs, Francisco	2 00
2d do., P. Knauf, Francisco	1 00
Best dozen ears late sweet corn, C. M. Hubbell, Ypsilanti	2 00
2d do., D. B. Peck, Jackson	1 00
Best dozen ears pop corn, C. W. Riggs, Francisco	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best six heads sunflowers, Martin Tanner, Jackson	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best six stems Swiss chard, Stephen Marx, Detroit	2 00
Best six stems parsley, Stephen Marx, Detroit	2 00
2d do., C. M. Hubbell, Ypsilanti	1 00
Best six stems spinach, Stephen Marx, Detroit	2 00
Best six stems English sweet or pot herbs, Stephen Marx, Detroit	2 00
3d do., Miss M. R. DePuy, Jackson	1 00
Best collection of pot herbs, Stephen Marx, Detroit	3 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Second best six stems kohl rabi, Stephen Marx, Detroit	1 00
2d do., C. M. Hubbell, Ypsilanti	2 00
Best four heads drumhead cabbage, C. M. Hubbell, Ypsilanti	2 00
2d do., Stephen Marx, Detroit	1 00

JOHN O'BRINE,
F. M. BOSWORTH,
A. G. GULLEY,
Viewing Committee.

CLASS 34—FLOUR, FEED, AND MEAL.

Best barrel of flour, made of white wheat, Elliott & Mowry, Jackson	$5 00
2d do., R. M. Webster, Armada	2 00
Best barrel of flour made of red wheat, R. M. Webster, Armada	5 00
barrel of flour made of spring wheat, R. M. Webster, Armada	3 00
sample bolted meal, Elliott & Mowry, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best sample corn meal, Elliott & Mowry, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best sample ground feed, Elliott & Mowry, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best sample of buckwheat flour, R. M. Webster, Armada	2 00
2d do., Elliott & Mowry, Jackson	1 00
Best sample rye flour, R. M. Webster, Armada	2 00
2d do., Elliott & Mowry, Jackson	1 00
Best sample Graham flour, R. M. Webster, Armada	2 00
2d do., Elliott & Mowry, Jackson	1 00
Best sample oat meal, Elliott & Mowry, Jackson	2 00
2d do., R. M. Webster, Armada	1 00

Best display of flour, meal, and feed, Elliott & Mowry, Jackson	$5 00
2d do., R. M. Webster, Armada	3 00

F. M. BOSWORTH,
A. G. GULLEY,
JOHN O'BRIEN,
Viewing Committee.

DIVISION G—DAIRY AND OTHER PRODUCTS.

CLASS 35—BUTTER, CHEESE, AND OTHER DAIRY ARTICLES.

Best twenty-five pounds of domestic butter, Mrs. John F. Drew, Jackson	$16 00
2d do., Mrs. Harrison Haynes, Grass Lake	12 00
3d do., F. L. Roser, Wellington, O	8 00
Best ten pounds of domestic butter, G. Van Houten, Grass Lake	8 00
2d do., Mrs. J. H. Corwin, Grass Lake	6 00
3d do., Mrs. Martin True, Rives Junction	4 00
Best exhibit of cheese from household dairy, J. H. Yocum, Wellington, O	10 00
2d do., F. L. Roser, Wellington, O	8 00
Best display of factory cheese, Walter Bordwell, Olivet	25 00
2d do., J. C. Chilson, Livonia	20 00
3d do., J. N. Loncker, Drenthe	15 00
Best churn, Vermont Farm Machine Company, Bellows Falls, Vt	1 00
creamer, Vermont Farm Machine Company, Bellows Falls, Vt	3 00
lever butter worker, Cornish & Curtis, Fort Atkinson, Wis	1 00
butter ladles, Cornish & Curtis, Fort Atkinson, Wis	3 00

NON-ENUMERATED.

Golden June butter color, F. B. Fargo & Co., Lake Mills, Wis	$3 00
Golden cheese color, F. B. Fargo & Co., Lake Mills, Wis	1 00
Butter printer, Vermont Farm Machine Company, Bellows Falls, Vt	1 00
Display of creamery butter, J. C. Cunningham, Reading	5 00

J. H. JONES,
A. D. GOODRICH,
D. M. UHL,
Viewing Committee.

CLASS 36—SUGAR, BREAD, AND PICKLES.

Best gallon maple syrup, D. L. Garver, Hart	$3 00
2d do., J. W. Helme, Adrian	2 00
Best ten pounds of maple sugar, D. L. Garver, Hart	5 00
Best three loaves salt rising bread, M. E. Bartlett, Tompkins	3 00
2d do., Miss Mary McCarthy, Jackson	2 00
Best soda rising bread, Mrs. W. N. Woodsum, Jackson	3 00
2d do., Mrs. J. F. Drew, Jackson	1 00
Best three loaves yeast bread, M. E. Bartlett, Tompkins	3 00
2d do., Miss Mary McCarthy, Jackson	1 00
Best corn bread, Miss Mary McCarthy, Jackson	3 00
2d do., M. E. Bartlett, Tompkins	2 00
Best three loaves brown bread, Miss Mary McCarthy, Jackson	3 00
2d do., M. E. Bartlett, Tompkins	2 00
Best sample of flour bread by girl under 16 years, Mary McCarthy, Jackson	3 00
2d do., M. E. Bartlett, Tompkins	2 00
Best sample of brown bread made by girl under 16 years, M. E. Bartlett, Tompkins	3 00
2d do., E. Blodgett, Jackson	2 00
Best display of pickled vegetables, R. M. Webster, Armada	5 00
2d do., J. W. Helme, Adrian	3 00

JACOB MARCK,
M. MARCK,
E. BARTLETT,
Viewing Committee.

DIVISION H—BEES, HONEY, ETC.

CLASS 38.

Second best colony of bees in movable comb hive, J. O. Bibbins, Hanover	$3 00
Best colony Italian bees, James Fry, Leslie	5 00
Best specimen of comb honey, H. D. Cutting, Clinton	10 00
2d do., James Fry, Leslie	5 00
Best specimen of extracted honey, James Fry, Leslie	5 00
2d do., H. D. Cutting, Clinton	3 00
Second best display of comb honey, James Fry, Leslie	5 00
Best display of extracted honey, T. P. Butcher, Spring Arbor	10 00
Best specimen of beeswax, James Fry, Leslie	2 00
2d do., H. D. Cutting, Clinton	1 00
Best specimen of artificial comb foundation, C. Quick, Leoni	3 00
2d do., H. D. Cutting, Clinton	1 00
Best collection of apiarian implements, H. D. Cutting, Clinton	10 00
Best knife, H. D. Cutting, Clinton	1 00
Best comb foundation machine, H. D. Cutting, Clinton	5 00
Best collection of bee hives, H. D. Cutting, Clinton	5 00
Best wax extractor, H. D. Cutting, Clinton	2 00
Best honey extractor, H. D. Cutting, Clinton	3 00
Best bee smoker, Buhl & Co., Union City,	2 00
2d do., H. D. Cutting, Clinton	1 00
Best collection of bee hives, Buhl & Co., Union City	5 00
Best display of observatory hives, T. P. Butcher, Spring Arbor	5 00

JOHN E. DICKER,
ERASTUS WEEKS,
C. E. LARRIBEE,
Viewing Committee.

DIVISION J—VEHICLES.

CLASS 45.—WAGONS AND CARRIAGES.

Best two-horse family carriage, Michigan Manufacturing Co., Jackson	$10 00
2d do., J. W. Hewett, Jackson	5 00
Best two-spring phaeton, A. Clark & Co., Lansing	6 00
2d do., Michigan Manufacturing Company, Jackson	3 00
Best three-spring phaeton, Clark & Co., Lansing	6 00
Best top buggy, Clark & Co., Jackson ?	6 00
2d do., Michigan Manufacturing Company, Jackson	3 00
Best buggy without top, Michigan Manufacturing Company, Jackson	6 00
2d do., J. W. Hewett, Jackson	3 00
Best trotting wagon, A. Bedford, Coldwater	6 00
2d do., J. W. Hewett, Jackson	3 00
Best trotting sulky, A. Bedford, Coldwater	6 00
2d do., A. Bedford, Coldwater	3 00
Best spring wagon for market, Michigan Manufacturing Co., Jackson	10 00
2d do., Michigan Manufacturing Company, Jackson	5 00
Best two-horse family sleigh, J. W. Hewett, Jackson	10 00
Best single cutter Clark & Co., Lansing	5 00
2d do., Michigan Manufacturing Company, Jackson	3 00
Best single farm wagon, Austin, Tomlinson & Webster, Jackson	5 00
Best horse cart, Austin, Tomlinson & Webster, Jackson	5 00
Best trucks for lumbering, Austin, Tomlinson & Webster, Jackson	3 00
Best display of Austin, Tomlinson & Webster, Jackson	10 00
Best display of Carriages, Clark & Co., Lansing	10 00
2d do., J. W. Hewett, Jackson	5 00

NON-ENUMERATED.

Chicago road cart, Michigan Manufacturing Company, Jackson	2 00
Two wheeled buggy, J. T. Howell, Jackson	5 00
Two horse shifting seat top buggy, J. W. Hewett, Jackson	3 00
Shifting seat body, J. W. Hewett, Jackson	5 00
Patent side spring gearing, J. W. Hewett, Jackson	2 00
Adjustable axle nut, Shear Bros., Kalamazoo	2 00
Display of carriage bodies in rough, A. L. Kellogg, Jackson	5 00

Basket phaeton, Jackson Carriage Company, Jackson	$5 00
Extension top barouche, Jackson Carriage Company, Jackson	5 00
Collection of springs, Jackson Carriage Company, Jackson	2 00
Line of axles, Jackson Carriage Company, Jackson	2 00
Delivery wagon, Milburn Wagon Company, Toledo, Ohio	5 00
Hearse, Carey & Delahanty, Jackson	5 00
Combined Wagon box and rack, McCallum Bros., Chicago	3 00
Bob sleigh, Austin, Tomlinson & Webster Manufacturing Company	3 00

H. M. DORRILL,
G. H. CURTIS,
D. BEDFORD,
Viewing Committee.

DIVISION K.—MACHINERY.

CLASS 46.—MACHINERY.

Best steam engine, Atlas Engine Works, Indianapolis, Ind	Medal.
Best circular saw mill, D. H. Bothwell, Jackson	Medal.
Best display of iron castings, E. T. Barnum, Detroit	$5 00
Best flue scraper, E. T. Barnum, Detroit	2 00
Best hoop machinery, G. W. Bowen, Grass Lake	Medal.
Best shaft coupling, E. Dennis, Jackson	$2 00
Best shaft hangers, E. Dennis, Jackson	2 00
Best mill-stone diamond dresser, W. W. Cleveland, Marshall	2 00

HENRY CHAMBERLAIN,
J. P. VAN DEVENTER,
Viewing Committee.

DIVISION L.—MANUFACTURED GOODS.

CLASS 48.—MATERIALS.

Display of wool from any county, R. M. Cross, Ovid	$25 00
Best display of fine wool, C. M. Fellows, Manchester	7 00
2d do., James M. Moore, Brooklyn	5 00
3d do., R. M. Cross, Ovid	3 00
Best display of long wool, John Taylor, Marcellus	7 00
2d do., Amos F. Wood, Mason	5 00
3d do., R. M. Cross, Ovid	3 00
Best display of middle wool, R. M. Cross, Ovid	7 00
Best display of flax, Miss Gertie McClary, Galesburg	5 00
Best display of prepared flax, Miss Sarah Barker, Fairfield	5 00

LYMAN CATE,
LINCOLN WOOD,
PHILO GIBBS,
Viewing Committee.

CLASS 49.—FACTORY MADE.

Best pair white woolen blankets, Mrs. C. J. Sprague, Farmington	$5 00

LYMAN CATE,
LINCOLN WOOD,
PHILO GIBBS,
Viewing Committee.

CLASS 51.—ARTICLES OF LEATHER AND INDIA RUBBER.

Best pair gents' summer boots, W. N. Woodsum & Co., Jackson	$1 00
Best pair winter boots, W. N. Woodsum & Co., Jackson	1 00
Best pair kip boots, W. N. Woodsum & Co., Jackson	1 00
Best pair ladies' summer walking boots, W. N. Woodsum & Co., Jackson	1 00
Best pair ladies' winter walking boots, W. N. Woodsum & Co., Jackson	1 00
Best pair ladies' winter shoes, W. N. Woodsum & Co., Jackson	1 00
Best pair misses' shoes, W. N. Woodsum & Co., Jackson	1 00
Best pair children's shoes, W. N. Woodsum & Co., Jackson	1 00
Best pair gents' slippers, W. N. Woodsum & Co., Jackson	1 00
Best pair ladies' slippers, W. N. Woodsum & Co., Jackson	1 00
Best double carriage harness, E. D. Bliss, Jackson	3 00

Best single carriage harness, E. D. Bliss, Jackson	$3 00
2d do., E. D. Bliss, Jackson	2 00
Best double cart harness, E. D. Bliss, Jackson	2 00
Best sole leather, W. N. Woodsum & Co., Jackson	5 00
Best calf skin, W. N. Woodsum & Co., Jackson	3 00
Best other kind leather, W. N. Woodsum & Co., Jackson	3 00
Best morocco leather, E. D. Bliss, Jackson	3 00
Best horse collar, E. D. Bliss, Jackson	2 00
Best riding bridle, E. D. Bliss, Jackson	2 00
Best display boots and shoes, W. N. Woodsum & Co., Jackson	10 00

ALBERT A. WILCOX,
RANSOME C. SAWDEY,
Viewing Committee.

CLASS 52.

Best lounge or couch, H. C. Ransom, Jackson	$2 00
Best easy chair, H. C. Ransom, Jackson	3 00
Best lounging or smoking chair, M. R. Davis, Jackson	2 00
Best centre table, H. C. Ransom, Jackson	3 00
2d do., W. J. Fuller, Sandstone	2 00
Best library table, H. C. Ransom, Jackson	2 00
Best mantle mirror, H. C. Ransom, Jackson	3 00
Best chamber set, H. C. Ransom, Jackson	10 00
Best spring matress, H. C. Ransom, Jackson	2 00
2d do., D. B. Peck, Jackson	1 00
Best set dining room chairs, H. C. Ransom, Jackson	3 00
Best sideboard, H. C. Ransom, Jackson	3 00
Best book case, H. C. Ransom, Jackson	3 00
Best office chair, H. C. Ransom, Jackson	2 00
Best display of furniture, H. C. Ransom, Jackson	15 00
Best office desk, H. C. Ransom, Jackson	2 00
Best parlor writing desk, W. J. Fuller, Sandstone	3 00
2d do., H. C. Ransom, Jackson	2 00
Best child's carriage, H. C. Ransom, Jackson	2 00
Best assortment school furniture, Union School Furniture Company, Battle Creek	Diploma.
Best set parlor furniture, H. C. Ransom, Jackson	10 00

A. F. CHANDLER,
F. G. FINLEY,
HENRY SIMMONS,
Viewing Committee.

CLASS 53—STOVES, IRON WORK, ETC.

Wire flower stand, E. T. Barnum, Detroit	$1 00
Fruit or revolving stand, E. T. Barnum, Detroit	2 00
Aquarium and pedestal, J. V. Jenkins, Jackson	2 00
Screen doors and windows, Porter Manufacturing Co., Burlington, Vt.	2 00
Cast iron grate, E. T. Barnum, Detroit	3 00
Wire fence, hitching post, spark arrester, fire guards, weather vanes, riddles, etc., E. T. Barnum, Detroit	10 00

A. F. CHANDLER,
F. S. FINLEY,
HENRY SIMMONS,
Viewing Committee.

DIVISION M.—SURGICAL INSTRUMENTS, ETC.

CLASS 54.

Display of dental work, J. R. Robinson, Jackson	$10 00

M. P. ANDERSON,
Viewing Committee.

DIVISION N.—PAINTING AND SCULPTURE.

CLASS 56.

Best landscape painting in oil scenery in Michigan, J. R. Wycoff, Jackson	$10 00
2d do., A. J. Brow, Detroit	5 00

Best composition landscape in oil by exhibitor, J. R. Wycoff, Jackson	$5 00
2d do., Robt. Fawcett, Livonia	3 00
Best landscape from nature in oil by exhibitor, H. Bissell, Jackson	5 00
2d do., Miss E. Kellogg	3 00
Best animal piece from life by exhibitor, Miss Ada Upton, Big Rapids	5 00
2d do., Mary Ryther, Three Oaks	3 00
Best bird piece in oil by exhibitor, Miss E. Kellogg, Jackson	5 00
2d do., Mrs. Buggie, Coldwater	3 00
Second best marine scene in oil by exhibitor, Mrs. H. Bissell, Jackson	3 00
Best fruit piece in oil by exhibitor, Mrs. J. C. Lowell, Jackson	5 00
2d do., Miss Kate Robinson, Jackson	3 00
Best flower piece in oil by exhibitor, Miss Ada Upton, Big Rapids	5 00
2d do., Mrs. W. K. Gibson, Jackson	2 00
Portrait from life in oil by exhibitor, J. R. Wycoff, Jackson	10 00
Portrait from life, cabinet size in oil by exhibitor, J. R. Wycoff, Jackson	5 00
Best fancy painting in oil by exhibitor, Mrs. W. K. Gibson, Jackson	3 00
2d do., Miss Maniates, Jackson	2 00
Painting in oil, by person under 16 years, Miss Kate Robinson	3 00
Best landscape in water colors of scenery in Michigan, Andrew J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best historical painting in oil, Andrew J. Brow	10 00
2d do., Mrs. J. M. Lewis, Jackson	5 00
Best landscape painting in oil, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best marine painting in oil, A. J. Brow, Detroit	5 00
2d do., A. J. Brow, Detroit	3 00
Best portrait in oil, A. J. Brow, Detroit	5 00
2d do., J. R. Wycoff, Jackson	3 00
Best special subject in oil, A. J. Brow, Detroit	5 00
2d do., Mrs. Buggie, Coldwater	3 00
Best special subject in water colors, A. J. Brow, Detroit	3 00
2d do., A. J. Brow, Detroit	2 00
Best collection of oil paintings by person not a dealer, J. R. Wycoff, Jackson	5 00
2d do., Mrs. A. Gale, Albion	3 00
Collection of water color paintings, by a person not a dealer, Miss Ada Upton, Big Rapids	3 00
Collection of oil paintings by dealer A. J. Brow, Detroit	25 00
Best winter piece in oil by exhibitor, Mrs. A. Gale, Albion	5 00
2d do., Mrs. H. Bissell, Jackson	3 00
Best pastel painting of landscape, A. J. Brow, Detroit	3 00
2d do., A. J. Brow, Detroit	2 00
Best crayon drawing of face, Henry Schaffer, Coldwater	2 00
2d do., J. K. Wycoff, Jackson	1 00
Crayon drawing of animal, Melton Reed, Jackson	2 00
Best collection of photographs, E. B. Bigelow, Jackson	3 00
2d do., Pendelton & Co., Jackson	1 00
Best photograph, life size, E. B. Bigelow, Jackson	2 00
2d do., Robt. Bailey, Jackson	1 00
Best landscape photograph, J. R. Wycoff, Jackson	2 00
2d do., Pendeltonn & Co., Jackson	2 00
Three cabinet photographs, E. B. Bigelow, Jackson	2 00
Best animal photographs, J. R. Wycoff, Jackson	2 00
2d do., E. B. Bigelow, Jackson	1 00
Six miniature photographs, E. B. Bigelow, Jackson	2 00
Best portrait photograph colored, Pendelton & Co., Jackson	2 00
2d do., E. B. Bigelow, Jackson	1 00
Six miniature porcelain photographs, E. B. Bigelow, Jackson	2 00
Engraving steel plate, A. J. Brow, Detroit	3 00
Pencil drawing full animal, J. H. Wycoff, Jackson	2 00
Pencil drawing, landscape, Pendelton & Co., Jackson	2 00
Best India ink drawing, Mattie Higgins, Jackson	3 00
2d do., Mrs. W. W. Andrews, Jackson	2 00
Display of gilt frames, A. J. Brow, Detroit	5 00
Best display of picture frames, A. J. Brow, Detroit	5 00
2d do., Pendelton & Co., Jackson	3 00

Best display of decorated porcelain, Mrs. D. C. Blair, Napoleon	$10 00
2d do., Mrs. A. Gale, Albion	5 00
Best painting on porcelain, Mrs. D. C. Blair, Napoleon	3 00
2d do.. Mrs. H. Bissel, Jackson	2 00
Best collection of paintings on slate, Mrs. W. K. Gibson, Jackson	5 00
Best specimen painting on plaque, Miss E. Kellogg, Jackson	3 00
2d do., Miss Maniates, Jackson	2 00
Best specimen of painting on slate, Miss Ada Upton, Big Rapids	3 00
2d do., Mrs. W. K. Gibson, Jackson	2 00
Best specimen of painting on silk, Mrs. C. B. Westren, Henrietta	3 00
2d do., Mrs. A. Gale, Albion	2 00
Best specimen of painting on holly, Mrs. J. C. Lowell, Albion	2 00
2d do., Mrs. S. E. Wells, Jackson	1 00
Best specimen of painting on ebonized panel, A. J. Brow, Detroit	3 00
2d do., Mrs. Mrs. H. Bissell, Jackson	2 00

NON-ENUMERATED.

Limoges, Mrs. H. Bissell, Jackson	1 00
Folding screen in oil, Miss Minnie R. DePuy, Jackson	1 00
Crayon drawing of child, Henry Schaffer, Coldwater	2 00
Painting on silk velvet, Mrs. D. C. Blais, Napoleon	1 00

C. H. RICHMOND,
FRANK LITTLE,
PHILO PARSONS,
Viewing Committee.

DIVISION N.—NEEDLE AND FANCY WORK.

CLASS 58—ARTICLES OF LADIES DRESS.

Best skirt, Miss P. Ragtzky, Jackson	$2 00
2d do., M. E. Bartlett, Tompkins	1 00
Best suit of under garments, A. Crittenden, Jackson	3 00
2d do., M. E. Bartlett, Tompkins	2 00
Best corset, Mrs. L. A. Smith, Jackson	1 00
Best child's suit, Mrs. Mary L. Acker, Charlotte, $2	2 00
Best display fur goods, R. R. Matteson, Jackson	$5 00 and Diploma.

MISS MINNIE H. BROW,
MRS. E. M. STERLING,
Viewing Committee.

CLASS 60.—PLAIN NEEDLE AND MACHINE WORK.

Best specimen of plain needle work, Mrs. W. N. Woodsum, Jackson	$3 00
2d do., Mrs. C. B. Westren, Henrietta	2 00
Best fine shirt by hand, Mrs. W. N. Woodsum, Jackson	2 00
2d do., Miss Jennie Overholt, Mason	1 00
Best pair of plain handkerchiefs, Mrs. W. N. Woodsum, Jackson	1 00
2d do., Miss P. Ragtzky, Jackson	50
Best silk patchwork quilt by hand, Miss Nettie Clarkson	5 00
2d do., Mrs. C. B. Westren, Henrietta	3 00
Best calico patchwork quilt by hand, Miss Gustie McClary, Galesburg	2 00
2d do., Mrs. R. E. Clark, Jackson	1 00
2d do., worsted, Miss N. R. Jenkins	1 00
Best plain white muslin quilt by hand, Mrs. W. W. Andrews, Jackson	2 00
2d do., Miss Mary Gilbert, Jackson	1 00
Best pair plain sheets by hand, Mrs. W. N. Woodsum, Jackson	1 00
2d do., R. M. Webster, Armada	50
Best pair plain pillow cases by hand, Mrs. R. E. Clark, Jackson	1 00
2d do., Mrs. Martin True, Rives Junction	50
Best sample of braiding by hand, Mrs. L. A. Smith, Jackson	3 00
2d do., Miss Etta R. Baker, Jackson	1 00
Best specimen of hem stitching by hand, Mrs. Mary W. Merriman, Jackson	2 00
2d do., Mrs. R. M. Webster, Armada	1 00
Best sample of patched garment by hand, Mrs. G. F. Merritt, Jackson	2 00
2d do., M. E. Bartlett, Tompkins	1 00
Best specimen plain sewing by machine, Mrs. R. E. Clark, Jackson	1 00
Best quilt made and quilted by machine, Mrs. C. B. Westren, Henrietta	2 00
2d do., Geo. Nuttin, Moscow	1 00

NON-ENUMERATED.

Best beaver robe, Nelson Howell, Eaton Rapids	$2 00
Best silk patchwork by hand, Miss Kate Robinson, Jackson	4 00

MRS. C. B. WESTREN,
MISS MARY GILBERT,
Viewing Committee.

CLASS 61—EMBROIDERY AND ORNAMENTAL NEEDLE WORK.

Best collection of ornamental needle work or embroidery, Miss Mary Gilbert, Jackson	$8 00
2d do., Mrs. S. E. Wells, Jackson	5 00
Best embroidered pillow covers, Mrs. R. R. Mattison, Jackson	3 00
2d do., Will A. Adams, Jackson	2 00
Best embroidered night dress, Miss P. Ragtzky, Jackson	2 00
2d do., Mrs. H. Underwood, Jackson	1 00
Best embroidered infant's blanket, Mrs. Cora Hall	2 00
2d do., Miss Etta R. Baker, Jackson	1 00
Best embroidered letters in marking, Miss Kate Robinson, Jackson	1 00
2d do., Mrs. Cora Hall, Jackson	50
Best embroidered infant's shirt by hand, Mrs. W. N. Woodsum, Jackson	2 00
embroidered table cover, Mrs. D. C. Blair, Napoleon	4 00
2d do., Mrs. Cora Hall, Jackson	3 00
Best embroidered letters in marking in silk, Mrs. Cora Hall, Jackson	1 00
2d do., Mrs. C. B. Westren, Henrietta	50
Best embroidered lady's dress, Miss Etta R. Baker, Jackson	3 00
2d do., Mrs. S. E. Wells, Jackson	2 00
Best specimen of chenille embroidery, Mrs. Kate Robinson, Jackson	1 00
cut or tufted work, Mrs. Cora Hall, Jackson	2 00
2d do., Mrs. Carrie Austin, Jackson	1 00
Best sample pair lamp mats, Mrs. C. B. Westren, Henrietta	1 00
combined fire screen in silk, Miss Etta R. Baker, Jackson	3 00
embroidered ottoman cover, Mrs. C. B. Westren, Henrietta	2 00
2d do., chair cover, Miss Kate Robinson, Jackson	1 00
Best sofa pillows embroidered in silk, Mrs. Cora Hall, Jackson	4 00
2d do., Miss Etta R. Baker, Jackson	1 00
Best embroidered foot rest, Miss Julia Mayforth, Jackson	2 00
2d do., Mrs. D. C. Blair, Napoleon	50
Best specimen Honiton lace work, Mrs. S. E. Wells, Jackson	2 00
2d do., Mrs. D. C. Blair, Napoleon	1 00
Best collection of lace work, Mrs. W. N. Woodsum, Jackson	4 00
2d do., M. E. Bartlett, Tompkins	2 00
Best graphic embroidery, Mrs. W. N. Woodsum, Jackson	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00
Best crewel embroidery, Mrs. L. A. Smith, Jackson	2 00
2d do., Miss Birdie McIntire	50
Best embroidered bracket, Mrs. Cora Hall, Jackson	1 00
2d do., Mrs. W. N. Woodsum, Jackson	50
Best embroidered wall pocket, Mrs. S. E. Wells, Jackson	1 00
2d do., Mrs. L. A. Smith, Jackson	50
Best fancy pin cushion, Mrs. H. Bissell, Jackson	1 00
2d do., Mrs. Cora Hall, Jackson	50
Best toilet set, Mrs. W. N. Woodsum, Jackson	1 00
2d do , Mrs. C. B. Westren, Henrietta	50
Best specimen macrame work, Mrs. B. F. King	1 00
sample macrame lace, Mrs. N. R. Jenkins, Jackson	2 00
2d do., W. E. Ambler, Pentwater	1 00
Best embroidered banner screen, Mrs. C. B. Westren, Henrietta	1 00
embroidered tidy in silk, Miss Mary Gilbert, Jackson	2 00
2d do., Mrs. Cora Hall, Jackson	1 00

NON-ENUMERATED.

Silk patchwork drapery curtain, Mrs. F. V. Smith, Coldwater	$5 00
Pair hand-made lace pillow shams, Mrs. Z. B. Goffe, St. Louis	3 00
Patent rocker embroidered, Miss Julia Mayforth, Jackson	2 00
Embroidered ottoman, Miss Julia Mayforth, Jackson	1 00
Sofa pillow, Mrs. A. Pitkin, Jackson	3 00

Embroidered pillow cover in silk, Mrs. C. B. Westren, Henrietta	$1 00
Embroidered hose, Mrs. W. N. Woodsum, Jackson	50

MRS. A. F. ALLEN,
MRS. J. WILSON,
Viewing Committee.

CLASS 61—CROCHET, KNIT AND FANCY WORK.

Best collection of knit, crochet and fancy work, Miss Carrie Choat, Jackson,	$5 00
Best Afghan robe, W. E. Ambler, Pentwater	5 00
2d do., Nelson Howell, Eaton Rapids	3 00
Best child's Afghan robe, Mrs. C. B. Westren, Henrietta	2 00
2d do., Mrs. Mary R. McNaughton, Jackson	1 00
Best cotton tidy, Miss Maniates, Jackson	2 00
2d do., Mrs. L. A. Smith, Jackson	1 00
Best worsted tidy, Miss Kate Robinson, Jackson	1 00
2d do., Mrs. C. J. Sprague, Farmington	50
Best pair toilet mats, Mrs. M. E. Bartlet, Tompkins	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00
Best fancy crochet hood, Mrs. Mary Austin, Jackson	2 00
2d do., Mrs. Martin True, Rives Junction	1 00
Best crochet or knit bed spread, Mrs. P. Ragtzky, Jackson	3 00
Best crochet shawl, Mrs. S. E. Wells, Jackson	2 00
2d do., Miss Mary W. Merriman, Jackson	1 00
Best crochet infant boots, Mrs. S. E. Wells, Jackson	1 00
Best knit infant shirt, Mrs. F. G. Merritt, Jackson	1 00
Best knit fancy mittens, George Nuttin, Moscow	2 00
2d do., M. E. Bartlett, Tompkins	1 00
Best crochet child's cap, Mrs. C. B. Westren, Henrietta	1 00
Best knit fancy purse, M. E. Bartlet, Tompkins	50
Best crochet lady's shoes, Mrs. L. A. Smith, Jackson	1 00
2d do., Mrs. C. B. Westren, Henrietta	50

NON-ENUMERATED.

Toilet set in silk on cord, Miss Nettie Clarkson, Jackson	$1 00
Tidy shawl, Mrs. J. D. Henkley, Jackson	1 00
Tatting chemise yoke, Mrs. John Murry, Jackson	1 00
Fancy knit hose, M. E. Bartlett, Tompkins	50
Thread tidy, Mrs. C. J. Sprague, Farmington	50
Ladies' crochet scarf, Mrs. L. A. Smith, Jackson	50
Bed spread, T. E. Wight, Milbury, Ohio	1 00

MRS. O. F. HALL,
MISS N. CLARKSON,
Viewing Committee.

CLASS 62—HAIR, SHELL, AND WAX WORK.

Best display of hair work, Miss E. L. Horton, Jackson	$3 00
2d do., Mrs. E. P. Reattois, Jackson	2 00
Best display of wax work, R. M. Webster, Armada	3 00
Best specimen feather fan, Mrs. Mary W. Merriman, Jackson	1 00
2d do., M. R. DePuy, Jackson	50
Best display of wax flowers, R. M. Webster, Armada	2 00
2d do., Mrs. W. N. Woodsum, Jackson	1 00
Best display wax fruit, R. M. Webster, Armada	3 00
2d do., R. M. Webster, Armada	2 00
Best artificial feather flowers, Mrs. W. W. Andrews, Jackson	2 00
Best artificial paper flowers, M. E. Bartlett, Tompkins,	1 00
Best wreath dried grasses, Mrs. W. K. Gibson, Jackson	2 00
2d do., R. M. Webster, Armada	1 00
Best bouquet dried grasses, Mrs. W. K. Gibson, Jackson	2 00
2d do., Mrs. C. B. Westren, Henrietta	1 00

NON-ENUMERATED.

Collection of butterflies and insects, G. H. McDale, Jackson	$1 00
Wax cross, Mrs. G. H. Sherman, Jackson	50
Worsted mats, Mrs. G. H. Sherman, Jackson	50
Wreath worsted flowers, A. Crittenden, Jackson	75

MRS. THOS. WESTREN,
MRS. CHAS. B. WESTREN,
Viewing Committee.

DIVISION P—MISCELLANEOUS.

CLASS 63.—MISCELLANEOUS ARTICLES.

Collection monumental work, L. D. Vireson, Jackson	$5 00
Collection fire brick, Jackson Fire Clay Company, Jackson	3 00
Barrel ground bone, C. R. Taylor, Jackson	5 00
Wrought iron fence, E. T. Barnum, Detroit	5 00
Pleasure boat, F. A. Drake, Eaton Rapids	2 00
Display coffins, etc., Carey & Delahanty, Jackson	5 00
Cattle stanchion, G. W. Smith, Addison	2 00
Pleasure boats, Forbes & De Law, Plain Mills	3 00
Canoe, A. J. Gould, Jackson	2 00

F. W. COOLEY,
W. K. NORRIS,
L. E. HINCHMAN,
Viewing Committee.

CLASS 64—HOUSEHOLD GOODS.

Best washing machine, H. B. Frey, Leslie	$2 00
Best wringer, G. F. Burtch, Jackson	1 00
Best refrigerator, Baldwin Manufacturing Company, Shelburn, Vt.	Diploma.
Best fruit drier, Lansing Fruit Drier Company, Lansing	5 00
Best display stove polish, F. Coykendal, Jackson	1 00

F. M. COOLEY,
W. H. NORRIS,
L. E. HINCHMAN,
Viewing Committee.

DIVISION 2.—CHILDREN'S DEPARTMENT.

Tidy, M. E. Bartlett, Tompkins	$0 25
Collection of wax flowers, M. E. Bartlett, Tompkins	50
Hand made shirt, M. E. Bartlett, Tompkins	75
Sofa pillow in worsted, Luella Holt, Jackson	50
Silk crochet collar, Minnie May Whitney, Jackson	25
Specimen knit lace, Myra S. Wood, Mason	50
Patchwork quilt, Myra S. Wood Mason	50
Fire oil paintings, Maggie Gilbert, Ypsilanti	1 00
Sofa pillow, Maggie Gilbert, Ypsilanti	1 00
Graphic embroidery, Maggie Gilbert, Ypsilanti	50
Can peaches, Lalla Sherman, Jackson	1 00
Embroidered lambrequins, Lalla Sherman, Jackson	50
Embroidered motto, Lalla Sherman, Jackson	50
Sample of bread, Lalla Sherman, Jackson	50
Pin cushion, B. Harrington, Jackson	50
Mat, B. Harrington, Jackson	50
Specimen of sewing, Jennie Overholt, Mason	50
Dried cherries, Miss P. Blodgett, Jackson	50
Macrame lambrequins, Birdie McIntire, Jackson	75
Macrame shopping bag, Birdie McIntire, Jackson	50
Specimens plain sewing, Grace Merritt, Jackson	50

MISS M. H. BROW,
MISS E. M. STERLING,
Viewing Committee.

REPORTS FROM COUNTY SOCIETIES.

MICHIGAN STATE ASSOCIATION OF AGRICULTURAL SOCIETIES.

TENTH ANNUAL CONVENTION AT LANSING, MICH., FEBRUARY 7-8, 1883.

OFFICERS:

President, Wm. Ball, Hamburg; vice-president, Ben B. Baker, Lansing; secretary and treasurer, Frank Little, of Kalamazoo.

Executive Committee—A. C. Gidden, Paw Paw; H. C. Sherwood, Watervleit; H. H. Hinds, Stanton.

The association is composed of delegates from agricultural, horticultural, and kindred societies of the State, and all persons interested in agriculture and the work of the association are invited to seats in the convention as honorary members.

OPENING OF THE CONVENTION.

Wednesday evening, Feb. 7, 1883, 8 P. M. Convention assembled in "Pioneer Hall," capitol building, Lansing, and in the absence of President Ball, was called to order by Vice-President Baker.

List of organizations and delegates that were reported at the secretary's desk:—

Michigan State Agricultural Society—W. J. Baxter, Wm. Ball, A. F. Wood.
Central Michigan Agricultural Society, Lansing—Ben B. Baker, J. N. Smith, D. F. Woodcock, L. B. Potter.
State Agricultural College—R. H. Baird, secretary.
Hubbardston Central—M. J. Miner, D. G. Burch, A. V. Phister.
Eastern Michigan—C. M. Fellows.
Kalamazoo county—C. E. Morrison, J. B. Cobb, Frank Little, S. B. Hammond.
Western Michigan, Grand Rapids—H. C. Sherwood.
Ionia county—D. H. English, M. Spaulding, A. M. Willets.
Jackson county—W. J. G. Dean.
Calhoun county—Wm. Radford.
Clinton county—R. B. Caruss.
Gratiot county—H. B. Baldwin, O. F. Jackson.
St. Joseph county—Joseph Farrand, J. McCoy.
Union Agricultural Society, Plainwell—Wm. Cox.
Van Buren county—E. B. Welch.
Secretary of States' office—Robert L, Hewitt, compiler farm statistics.
Ben B. Gibbons—Editor Michigan Farmer.

Thursday, February 8, 1883, 9 A. M.

The convention met on Thursday morning and was called to order by President Ball, who delivered the following address:

Gentlemen of the State Association of Agricultural Societies of Michigan:

The primary object of this association in its yearly meetings, is to discuss in a general manner topics pertaining to the best methods of conducting the various agricultural and mechanical fairs under the auspices of the different agricultural societies of this State; to determine, if possible, some plan or plans by which these yearly exhibitions shall be of the greatest benefit to the various industries represented, and at the same time prove remunerative to the organizations holding the same.

As an agricultural State Michigan has few equals. The variety of her productions is great, and her yields immense. She excels as a wheat growing State, both as to quantity and quality. Her soil is well adapted to the growth of Indian corn, as the large amounts yearly raised bear testimony. Large quantities of barley, oats, potatoes, beans and clover seed are yearly raised, as well as immense quantities of hay and other cereals that go to make a first-class agricultural State. As a sheep producing State she is one of the first. Michigan sheep are sought after both from the east and the west. From the east for her wethers to feed on account of their size, good fattening qualities, and strong, vigorous constitutions. From the west the demand is for her ewes for breeders and heavy shearers, and large numbers are yearly sold to supply the demand. Her fine wools are also wanted in the west and southwest, and already the trade is large. Her dry soil and cool climate are advantageous to the growth and development of this kind of stock.

Michigan is fast taking a position as one of the leading cattle States of this Union. Already she possesses large herds of improved breeds of cattle of great merit. Shorthorns, Holsteins, Jerseys, Herefords and some other breeds are found whose excellence stands unquestioned. Her horses are among the best, both as regards speed and draught. Breeding establishments are springing up in various parts of the State, and may we not hope in the near future to see her the equal of Kentucky or other old horse breeding States?

Her swine are equal to those of any State, and her poultry a credit to those engaged in its improvement. No State in the Union surpasses her in the variety and excellence of the fruits of all kinds, and I think I may safely say that ours is par excellence an agricultural State But we must not stop here. Added to her agriculture are her vast resources of pine and other timber of untold value. Her mineral wealth cannot be computed. Her coal beds are becoming sources of profit. Her brine is inexhaustible and the best in the world, and already she manufactures more salt than any other State. Her railroad facilities are among the best. Her water navigation excels any inland State. Her position, geographically, places her on the great thoroughfare from east to west, and it is not too much to say that, containing naturally all that makes a State rich and great, Michigan has no equal.

It is no longer a matter of doubt that agricultural fairs are a great benefit to the State when properly conducted, and also to those making the exhibit.

The important question to be settled is, how shall our fairs be conducted so that those attending shall be benefited, the exhibitors satisfied, the various industries of the State or location best promoted, and at the same time be pecuniarily successful. To this proposition I propose to say a few words, hoping that if no other good results come from them, they may provoke some discussion on matters of vital importance in managing agricultural exhibitions. There are many causes that help make fairs successful or unsuccessful. The responsibility does not rest entirely on those having the immediate control of their management. Very much depends upon the generosity and interest of the community where an exhibition is held. Where a village or city is liberal to the society which holds its fair within its limits, takes an interest in its success, and does not act as if it was a matter of necessity that the fair should be held there; where hotel rates are as reasonable during fair week as at other times; where Floral Hall is the recipient of the care and attention that those living in town should bestow; where a general interest is manifested by the citizens for the success of the Society rather than see how much can be made by them during the fair; where there is a determination to make the fair pleasant, agreeable, and profitable. success usually crowns the effort.

Much more depends upon the citizens of towns where fairs are held than is generally felt. Every organization should have some line of policy applicable to its peculiar location and wants by which it is guided, and its officers should understand their duties and perform them to the best of their ability.

No man should accept a position as officer in an agricultural society who will not take an active interest in its affairs and work for its success. And no man should be elected to fill such position who has not the practical knowledge requisite to ably fill it and the will and energy to use it. An army that is well officered is usually the successful one. Rules should be plain and easily understood, and care should be taken to make them applicable to the society they are intended to govern, and then they should be enforced by the proper officers. It has been said by some one that "order is heaven's first law," and perhaps there is no better place for its application than upon our fair grounds during our yearly shows. The grounds should be carefully and systematically arranged, and the exhibits properly classified. At our State and district fairs, I am of the opinion that catalogues containing each exhibitor's name and exhibit, plans of the grounds, showing where the different exhibits may be found, and containing nearly all the information that visitors desire, would be very desirable and productive of great benefit. These catalogues should contain at least all of the live stock entered for exhibition. Each animal should be entered in its proper division, class, and number, with age, color, etc., if of the cattle or horse department, and name and address of owner or breeder. I think enough could be sold to pay for printing, getting up, etc. I am aware it will be said that this would necessitate the making of entries in advance of the fairs. So much the better. I have been and am now strongly in favor of having all entries of stock for the State and Central Michigan fairs made at least a week preceding the fair. The rule has been in operation in both of these societies of late, and one week earlier would be all the time necessary to prepare the proposed catalogue.

Another good would arise from the early entries of stock. The superintendents would know with more certainty how many stalls for horses and cattle would be required, and how many pens for sheep and swine would be needed, and time given for their construction before the stock came on to the ground. Great inconvenience was experienced by several exhibitors of sheep at our last State Fair for the want of pens to put their stock in. Many fine-wooled sheep nearly died from the effects of the hot sun pouring down upon them in their uncovered huddles while waiting for shelter to be made for them. And this was also true of swine and cattle.

My idea then in regard to entries of live stock is that two weeks is none to long for entries to be made before the fair. The secretary has time to get his books in good shape. The superintendents have time to prepare stalls and pens for their departments, and much of the confusion, fault-finding and disorder which is frequently seen at some of our fairs would be avoided, and order and system prevail instead. A fair cannot be managed successfully for any length of time, the paramount idea being the amount of money to be secured. Neither can a fair be successfully managed simply as an exhibition of stock, vegetables, machinery, etc., without it attracts enough people who pay for the show to keep its financial condition good. The two ideas, how to make a valuable, educational and attractive exhibition and have it pecuniarily successful, must be considered together.

No fair can be a success financially that has few attractions. People differ materially in their tastes and desires, some being gratified with one thing and some with another. Some people go to a fair to see machinery, some to view the exhibits in floral hall or art halls, some to look at cattle, some sheep and swine, some to view the horses; some one thing and some another. A large number go to have a good time, and want to take in the whole fair.

Knowing the different inclinations and tastes of those who would attend agricultural and other exhibitions, it would seem to be the province of the managers of fairs to get together as many attractions as possible that are wholesome and good, aside from the products of the forge, the loom, or the field. A military display is always attractive. Properly conducted trials of speed, both trotting and running, always draw and pay well. And right here I know I am on debatable ground, for there are many who seriously object to horse-racing on fair grounds or other places. In my opinion a trial of speed without the pool-box, and under proper authority, is as legitimate as an exhibition of draft horses when put to the test of their ability, or an exhibition of cattle, sheep, or swine. Breeding horses for speed is recognized as a legitimate branch of stock raising, and as such is entitled to all the privileges and rights given to any other branch of agriculture. And in no other way can animals bred for speed be tested than by trotting, pacing, or running. And although I am not a breeder of horses, and personally care very little about speed performances, a large majority of people do, and in a legitimate way they should be gratified. It will pay, too. Any amusement that is harmless and attractive may properly find a place on our fair grounds during exhibitions if they yield an income to the society. In my judgment wheels-of-fortune, and all gambling devices calculated to corrupt the morals of old and young, should not find any place on the grounds of any society. As finance is one of the things to be looked to, a just discrimination should be made in admission or exclusion.

My observation and experience for the past number of years in the show ring, leads me to the conclusion that one good judge in any class is better than three not as good, and easier to be obtained, and at a less expense to societies that remunerate in any manner a judge. So far as I know, in the State and district fairs in the poultry department only one judge is required, and very little fault is found with the awards made. If one man acts as a judge in any department, he cannot shirk any responsibility connected with his department, and he would be able to give reasons for his opinions expressed in his awards if called for. With one judge in each class or department, the work of judging would be greatly accelerated. Exhibitors would be relieved of the uncertainty as to the time when the committees would work, and instead of being obliged to be on hand day after day to show their stock, etc., they would be through with the disagreeable part of their work and have some time to look around and see what others have on exhibition. I throw out these suggestions with the expectation of having them opposed.

Many societies in this State have issued and sold what are called "life membership tickets." As a rule they have done so to bridge over present difficulties. While they assisted somewhat at the time in a financial point of view, in very many cases the plan worked disadvantageously afterwards. In many instances when societies stopped selling such tickets after a while, bad feelings were indulged in by those who wished to purchase such tickets and could not, and in most cases the plan of selling life membership tickets has proved injurious.

One of the many difficulties in conducting a fair is the solution of the problem, how shall exhibitors, with their attendants, and booth and stand men with their attendants, be admitted to the grounds of the society during its fair. In county fairs the difficulty is not very great, but at the State and district fairs, it is one of the perplexing things with which those conducting exhibitions have to contend.

It is one of difficulty, for exhibitors help largely to make the show, and their rights must be respected, and at the same time the interests of the society must be guarded. That the system of issuing attendants' tickets is liable to abuse, that the necessity of doing something of the kind is demanded, is a subject that is not easy of a perfect solution.

I hope the matter may receive some attention at this meeting. There are many other manners connected with the conduct and control of agricultural and mechanical societies that might be mentioned, but many of them are noticed in the programme of exercises, and will undoubtedly receive the attention their merits deserve.

Let me recapitulate some of the many needs that our agricultural exhibitions require, to make them successful as representative of the great variety of the products of the soil, of the manufactures and the arts of this truly great State, as well as to make them financial successes. First, select good, active men and women to fill the responsible positions that belong to such societies; those who know what is required to make a good exhibition and are willing to work to the end. Select such places for fair grounds as are pleasant, easily accessible, that contain conveniences necessary for an exhibition, and where the resident population are willing to work and will work to make the matter a success. The rules and regulations which govern a society should be as few as will cover all that is necessary for the good conduct of the fair, and so plain that only one construction can be placed upon them.

Each superintendent should have control of his or her department, and be held strictly responsible for its management to the controlling officers of the society, financially and otherwise. A perfect system of accounts should be kept by all societies and in each department. Much greater expenses are sometimes incurred if all expenses come in together, than when each officer is charged with the expenses of his department. Men do not like to have extravagances charged to them individually, and if this plan of making each superintendent or officer in any department show his own expenses, there is no doubt a saving will be made in all societies who insist on this method in the place of the former.

The rights and comforts of visitors and exhibitors in our exhibitions should always be a matter of solicitude to the officers in any society. Knowing well that all kinds of fraud are attempted to get upon the grounds during the exhibitions without pay, by the unscrupulous, still the large majority of visitors are honest, and care should always be taken to make everything pertaining to the exhibition as entertaining and pleasant as possible, for good will toward any project where the masses are concerned, is a strong element of success.

As liberal premiums, and as many in number, reaching to the 3d and 4th, as a society can pay without loss, should be offered. Exhibitors are encouraged to bring out their products stimulated by the prospect of a suitable reward if their exhibition is worthy, and an interest is awakened which would otherwise have remained dormant. Rules of entry should be imperative. When the time comes to class them, they should be classed, let the time be when it may. Too much of the time of the fair proper, in many societies, is taken up in getting ready.

A fair should not be opened to the public until it is complete in all its parts. The public should understand that the exhibition on its first day is as complete as on any other day, and instead of having one or two "full days" as the saying is, every day will have a respectable number, and the aggregate of attendance will be greatly augmented.

The exhibition should be complete from its public opening. The inquiry is a general one, what days will be the best? The answer should be, "all" days are the best, then visitors would come when it suited them.

It frequently happens that Wednesday or Thursday, the days that are considered best, are rainy days. If one day was as good as another, you would have received some of the receipts on the previous days, which had ordinarily been kept for the "best days," and hence be so much ahead financially. Another thing, the crowds of the "best days" would be divided up more evenly through all the days of the fair.

What would be thought of a theatrical performance that was prepared after the audience had assembled! A working in the direction above indicated, in my opinion, is a step in the right direction.

Without any attempt at writing what might be called an address, I have hastily written what seems to me some ideas, which, if put into practical use as fast as societies were ready to adopt them, would be an improvement in some respects upon the plans now in vogue. Hoping that it may be the means of calling out discussion, I will close by thanking you for your kind attention.

The Secretary of the association, Mr. Frank Little, of Kalamazoo, addressed the convention on the subject of agricultural fairs. He spoke as follows:

Agricultural societies, with their annual exhibitions, are, so far as their influence extends, practically schools of education in all the various branches of farm industry.

Wide awake, progressive, intelligent farmers, are of incalculable benefit to every agricultural community. It should be the highest aim of all our associations to increase in every way possible the number of thorough-going, practical farmers.

In this connection should be mentioned the invaluable influences of the press, and agricultural literature of modern times. These are mighty engines in the work of educating the people, stimulating them to higher aims and loftier attainments. With an all pervading, untiring zeal that never relaxes, they visit at regular intervals all classes of people. They wield an influence second to none in the world of thought, while they instruct and enlighten mankind in all that pertains to the world's progress and development.

As valuable auxiliaries in the rural education of the people, agricultural societies occupy a prominent, honored place.

An agricultural fair with all its magnificent aggregation of the products of the field, the household, the stable, and the workshop, exerts a potent influence upon all who throng its gates. It affords convenient facilities and a grand opportunity for comparing breeds of animals, general methods in farming; the exhibition of farm products, and rich and meritorious articles in all the varied departments of the fair, as well as for social intercourse among neighbors and friends, and widening the field of acquaintanceship. At the fair, intelligent men and women add much to their general fund of knowledge, gathering practical hints and suggestions of inestimable value.

Like the kingdom of heaven, the germ of thought "is as a grain of mustard seed which a man took and cast into his garden, and it grew and became a great tree so, that the fowls of the air lodged in the branches thereof." We also aim to cast abroad precious seed, which, taking root and springing up, we know not when or where, shall bring forth fruit—"some forty, some sixty, and some an hundred fold." We are materially aided in our work by a common bond of union, sympathy, and self-interest that pervades all classes, fully illustrating the sentiment of the universal brotherhood of man.

The progressive farmer challanges comparison with his neighbors in stock-breeding, raising of crops, and all the varied products of the dairy, the household, the garden and the orchard.

These annual festivals gather up and epitomize the achievements and discoveries of the year; and new thoughts and new ideas are developed and disseminated.

Thus, literally—the wilderness is made to blossom; the earth to yield her increase. And on every hand, we behold fertile fields; peaceful homes; waving harvests; innumerable flocks and herds; and millions upon millions of happy, prosperous people.

If these annual exhibitions and farmers' festivals are schools of learning and social reunions of the people, then a great responsibility rests upon the officers and managers in respect to their general character, excellence and utility.

The revenues of a society are, of course, an important feature, and determine its financial success. It may properly be remarked in this connection that many societies languish and die for want of proper support. Probably not one-half of the farming population even contribute anything to their support.

There are four principal sources of income to most of our societies:

1. Rent of booths or stands.
2. Membership tickets.
3. Entrances for speed.
4. Admissions at the gates.

Our statutes permit boards of supervisors to levy a small tax each year for the support of county societies. But supervisors, as a general rule, do not appreciate this privilege, and the tax is not assessed.

Societies having large expenses to meet, financially burdened it may be, with no sure fixed income, are sorely tempted to avail themselves of assistance from sources, to say the least, of a questionable character.

Licenses are sometimes given for setting up on the grounds immoral shows; wheels of fortune, and gambling devices; liquor stands, and many other things of evil influence and bad repute.

While we may properly encourage the growth of sorghum, as a field crop—we may not be justified in promoting the raising of *Cain* of another species,—either on the fair grounds, or elsewhere.

Sideshows frequently occupy valuable space; intermingled with the exhibition halls, stables, pens and agricultural implements; and obscuring the general view of the grounds. All are rendered difficult of approach, by entangling stakes, ropes, guys, and long stretches of gaudily painted canvass. These outside scenic illustrations of voracious animals, reptiles, mermaids, giants, dwarfs, fat women, and other hideous monstrosities are usually more interesting and meritorious than the performance on the inside which they represent.

An honest granger, desirous of visiting Art hall,—mistakes the entrance, and plunges unceremoniously into a bear den; or, into the dangerous midst of a band of painted, blood-thirsty, scalping savages. Seeking to escape, he rushes suddenly into the awful presence of the "Circassian Beauty," that captivating syren, that has infested agricultural fairs, ever since the birth of the oldest inhabitant.

Why should these institutions spread their tents, and rasp the air with their speeches, tom-toms and hand organs, in the very heart and centre of the fair ground.

They may amuse a certain number of people. They pay a small tax into the treasury; but agricultural societies should be sustained without such accessories. If they must be, put them in a corner out of sight.

All sorts of side enterprises seek admission to the grounds. Secretaries receive many letters upon the subject previous to the fair. The exact nature of the proposed business is not always clear. But perhaps none of these letters are quite as ambiguous, as one received by a secretary from a stalwart farmer, desirous of making some entries at the fair, who wrote:—"Please enter me on your books for a jackass, and for a horse for general use." The secretary replied, that the rules of his society would not permit entering one animal for two prizes!

Large sums of money are offered every year at all the fairs, for the right to set up wheels of fortune inside.

One thousand dollars, it is said, was paid in this State the past season, for the privilege of running one of these gambling, robbing machines at a single fair. And that the machine in question, netted its operators in three days, the snug sum of $3,000.

It has been claimed in extenuation, that this game is eminently a fair one:—The money of the wheel on the inside, of equal amount and risk, against the money of the player on the outside.

The shallowness and falsity of this statement is shown in the fact, that the wheel men pay $1,000, or more, as the case may be, for the even chance of winning other peoples' money and of losing an equal amount of their own.

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In Æsop's Fables it is recorded that the fox, and other beasts of the forests, were once invited to pay their respects to the lion, sick in his den. On nearing the mouth of the den, the wary fox noticed that the tracks of all the animals that had preceded him pointed inward; but none outward. So the fox turned aside, sagely concluding that his skin was safer in the open air.

The careful spectator of the operations of the wheel of fortune, will discover—that the dollars laid down on the cloth by the simple ones, are being constantly raked into the vortex and den of the wheel, and that seldom do their feet turn outward, or are they returned to their rightful owners.

The officers of the fair may attempt to shield, or solace themselves with the truism, "That a fool and his money are soon parted," and that he will never lack for opportunities to achieve this separation, whether on or off the fair ground. This may be true, but are we hereby justified, in licensing a band of robbers to prey upon the weak and the incompetent?

We should unite with all good citizens in striving to keep our young men free from the contaminations of vice, knowing that the future welfare and destiny of society and the state, rests mainly for security upon the virtue and integrity of the people.

An Irishman once complained of his physician—"that he stuffed him up so full of drugs while he was ill, that he was sick a long time after he got well."

In morals also, a man may sow his wild oats in his youth, and then settle down as a staid and respectable citizen; but he will not immediately recover from the scars and reproaches of his profligacy until long after he has abandoned his evil practices.

We are pointed to the church and the Sunday-school, as institutions expressly designed for the moral and religious education of the people; and that the missionary field is outside the fair ground.

It is obvious, to every careful observer, that churches and Sunday-schools in our modern times, exert but little influence in shaping the morals of community; and our main reliance rests upon good influences in the home training of children; their separation from vicious associates; a correct public sentiment; and the restraints of the civil code.

An eminent writer has fitly said—"that our manifest destiny, and the genius of our national idea is substantiated by exhibiting its practical development in the great and ever enlarging spheres of industry, government, morality, and religious faith."

We have a mission—an important stewardship in the world of progress. Let us acquit ourselves like men in the faithful discharge of every trust.

How sublimely grand and magnificent the realm of nature spreads out before us. How vast the resources of the country—and its political power and influence. Who can measure or weigh the industrial energies and capacities of the people?

Amid privations, and the sturdy discipline of toil, down through the ages, like the rills of the mountains, the brooks of the meadows, and the mighty rivers that roll to the sea, so, these combined efforts—the grand aggregation and results of personal industry, enterprise, and thrift, have established society, nurtured the arts, sciences, mechanical, educational, religious, and benevolent institutions of the day, and, like a resistless tide, influenced and controlled all our national prosperity and national life.

The remainder of the forenoon session was occupied with a lively discussion on the subject of membership tickets; and also the issuing of 3d and 4th prizes.

Thursday Afternoon.

Mr. Robert L. Hewett, of the Secretary of State's office, read the following paper on

STATE CROP REPORTING SYSTEMS.

Mr. Chairman and Gentlemen of the Convention :

A little more than a week ago I received a letter from your secretary, requesting me to hold myself in readiness to respond to a call, upon any branch of the general subject of agriculture I might choose. As I am not a member of your organization, nor of any one of your organizations, have no experience whatever in the management of fairs, nor any pet theories as to their management which I would care to present for the criticism of experienced, practical men, like the gentlemen present, you will pardon me for choosing a subject in which I am more directly interested, and with which I am therefore better acquainted. I take as the subject of this paper, "The State Crop Reporting Systems." It certainly will not be inappropriate to present this subject to any organization whose principal purpose is the advancement of agriculture. It has been more or less fully discussed in other States, but I believe never yet upon a Michigan platform, nor very thoroughly by the Michigan press.

The State crop reporting systems.—When were they established, why were they established, what have they accomplished?

The first crop reports issued under State authority were published by Secretary S. D. Fisher, of the Illinois Board of Agriculture, in the year 1876. In that year the number of correspondents reporting to him from each county was three, increased to five in 1877. The subject was first broached in Michigan by the Secretary of State in 1877, in the introductory to the cereal report; it was referred to again in 1878, when it was asserted that "the reporters should be located in each township, and their final reports of each wheat crop should show the actual average yield per acre, machine measure." This is the earliest proposition for a system of township reports of which I have knowledge.

Attention was again called to the matter by the Secretary of State in 1880, in the introductory to the Farm Statistics. The bill providing for the publication of the reports was introduced in the House by Representative Charles W. Garfield, Secretary of the State Horticultural Society, and carried through the House mainly by his efforts. It was managed in the Senate by Senator Mars, of Berrien county. The firt report under this law was issued in September, 1881. The wheat estimate published in July of that year was prepared from estimates made by supervisors.

In 1881 the first Ohio report was published by Mr. Chamberlain, Secretary of the Board of Agriculture, and during the past session Indiana published a monthly statement.

Why were the crop reporting systems established?

It is commonly asserted by the producers of this country that the price of produce is controlled by speculation, rather than by laws of supply and demand; that the speculators manipulate the markets in their own interest and to the great injury of the producing class. This assertion can hardly be successfully maintained. Supply and demand do always control the price, and when it seems to be otherwise in this country careful examination will reveal the fact that the supply rather is what is controlled. It may be controlled either by "cornering" the market, or by circulating widely exaggerated stories of immense production and consequent surplus by which the producers are led to believe that the supply is greatly in excess of the demand. In the latter case, no matter how ridiculously absurd the stories, they have all the force of truth to the deceived producer, and control the price of his surplus. It however occurs, and can occur, only when the grain dealers are able to obtain more promptly and accurately than the producer can, the information concerning the probable supply and demand. When the dealers possess a monopoly of crop information, we need not be surprised if they use their monopoly powers as other monopolists do; but make the sources of information equally accessible to both classes, and there is no reasonable excuse for the producers being cheated. Until recently it has not been possible for the producers to obtain the information so vitally important to them. As compared with the number of producers in the country, the number of dealers is insignificant, but being a wealthy class, or at least controlling vast sums of money, and being concentrated at business centers, it is not difficult for them to organize their strength and wield it as a unit. The limited number of dealers, the large moneyed interests of each, and their concentration, are the principal elements of their vast power. One of the chief objects of their organization is to ascertain promptly and accurately the probable outcome of the growing crops. For this purpose they employ men who travel from county to county and from State to State, and carefully examine the crops and report upon their probable yield. Secretary Fisher, of the Illinois Board of Agriculture, says: "It is well known that dealers employ the best talent in the market to travel over the grain-growing States to examine into the condition of the growing crops, with a view of approximating as to the area of each crop, and to develop other facts that would enable them to determine the value of prospective crops for speculative purposes" One of these agents visited the office of the Secretary of State July, 1881. He had already traveled through Kansas and Illinois, and went from here to Ohio and Indiana. A few days later I heard of him at Columbus, Ohio, where he made Secretary Chamberlain a call similar to the one made at the Secretary's office. It was this man's practice to leave the cars at the chief points in the principal wheat-growing sections, make inquiries of farmers who chance to be in town, and particularly of agricultural implement dealers, who, he said, were generally well posted, and finally with a livery team and driver to go through the country and make a personal examination of the wheat yields. He had learned that the Secretary was preparing a wheat estimate, and was quite anxious to secure our figures, but as the estimate was not ready to give to the public, he could not, of course, be accommodated. However, as he had traveled through the southwestern counties where the wheat crop was seriously injured, we consented to compare his estimates for these counties with our own, and was surprised to find how closely the two estimates agreed. For St. Joseph county, where in 1881 the crop was almost a total failure, his estimate differed from ours only about one per cent. The reports made by him and by other agents sent out from the same source and for the same purpose, were intended to form the basis, for the crop of 1881, of the Chicago wheat dealers. His reports, as he himself told me, were never made public. They were for the sole use and benefit of the Chicago grain dealers, whose property they were. They had been obtained at great expense, by interested parties, for personal ends. The general public had no right to them, and there was no way for it to obtain them if it had. If the general public wanted such information, it must adopt methods to secure it at its own expense.

The public at length came to understand the situation, and to realize that if, in its dealings with professional grain dealers, it would be their equal and not at their mercy, it must secure for itself crop information as authentic as that secured by the dealers.

It was to secure this information that our State system of crop reporting was established.

If it be asked why the States undertake this work, the reply is, first, that except the grain dealers, the States alone are in position to secure the information promptly and accurately.

The grain producers have, in the aggregate, the same money interest in each crop as the grain dealers, but in all other respects the condition of the two classes is widely different. The dealers are all located at a few business centers, while the producers are scattered from one end of the country to the other; the dealers are numbered by hundreds, and producers by millions; each dealer may have thousands or even hundreds of thousands of dollars at stake in each crop, while each producer can at the most have but a few hundreds. In Michigan the great wheat crop of 1880 averaged only about 255 bushels to each farm, and the poor crop of 1881 averaged less than 165 bushels to each farm. As the limited number, concentration at business centers, and large money interests of each, make it comparatively easy for the dealers to organize and act together, so the reverse of these conditions make it impossible for the producers to organize and act at all. But were it possible for the producers to secure crop estimates, they would be accepted by all other classes only as an offset to the estimates furnished by the dealers,—the estimates of one interested party as against those of the party of opposite interests.

The National system of crop reports is correct in principal, and, in the absence of anything better, and when under the direction of competent statisticians, has been of great use to the country in approximating the crop products, but attempting as it does to estimate for the entire country, it cannot, at critical seasons, receive detailed reports from the more distant points with that promptness that is absolutely necessary to a successful system of crop reporting. In illustration, the Michigan Crop Report for August was issued on the 11th of that month, and contained statements from correspondents in various parts of the State, from which we were able to estimate with substantial accuracy. I think that more than 11,000,000 bushels of our magnificent wheat crop was exposed to, and greatly damaged, much of it being made worthless except for feed, by the rain beginning on the 31st of July, and continuing to the 8th or 10th of August.

The National report for August makes no mention of damage to Michigan wheat by the unprecedented rain, but the October report contains a paragraph from the Michigan Statistical Agent, in substance very like our own report of a month earlier date.

The great breadth of the territory for which the estimates of the National reports are made, requires such a large number of correspondents, and consequently such a large number of reports, as to render it impossible that individual reports should be properly scrutinized. As might be expected, errors that would be amusing, were it not that they are serious, find place in the department reports.

Secretary Chamberlain, of Ohio, calls attention to a report of spring wheat in Ohio, where no spring wheat is raised any more than cotton and oranges are.

A late report shows that in Crawford county, Michigan, corn is a "good deal soft from wet." When we remember that Crawford county in 1881 raised about 200 acres of corn, which yielded about 3,500 bushels, a yield that could not have been very much increased in 1882, and comparing this product with the total product of the country, 1,624,917,800 bushels, the insignificance of the report from Crawford county becomes apparent; yet to persons unacquainted with the geography and production of the State, this will be considered as important a report as one from Kalamazoo, Lenawee, Oakland, or Washtenaw. In the preparation of the Michigan reports every answer is carefully examined, and all unreasonable or evidently erroneous answers thrown out. Again, the National Bureau cannot, like the States, correct by any actual canvass, each estimate before the next is made. The National census is taken only once in each period of ten years, and never until 1880 has there been a census of the crop acreage. On the other hand, all of the States publishing monthly reports collect the crop statistics annually by actual canvass. The advantage this gives to the States, as compared with the National Bureau, is obvious.

In Michigan the estimates are usually based upon the totals in the farm statistics which are collected annually. Thus if the farm statistics show that in a given township there were 500 acres of corn produced last year, and the correspondent estimates the present acreage at 90 per cent, or 110 per cent of last year's acreage, we know exactly what he means, and have no difficulty in making the public understand what is meant.

In like manner the yield is estimated until it can be definitely ascertained after the crop is harvested. Last fall through correspondents the Department furnished blanks for a threshers' record of the acreage and yield of wheat and oats. Returns were received of the actual yield, machine measure, of about one-sixth of the wheat acerage of the State. These returns and the total acreage as shown in the farm statistics, form the basis of our estimate of the total product.

What has been accomplished? Upon this subject, referring to the crops of 1881, John R. Dodge, statistician of the Department of Agriculture at Washington, says:

"The wheat harvest of 1881 in the United States furnishes a striking illustration of the effect of statistics upon prices. Buyers were urging moderate views; the National and State reports showed a crop of less than 400,000,000 bushels, instead of 500,000,000; the growers advanced their rates, refusing to sacrifice the five to ten cents difference per bushel. The value to growers of this information, at the moderate rate of 4 cents per bushel, on 250,000,000 bushels sold, would reach $10,000,000. It is probable that the publication of approximately accurate crop statistics, during the past year of comparative failure in the production of the United States, saved to the producers of cotton, wheat, corn and other producers, at least $20,000,000, which otherwise would have gone into the pockets of the dealer and middleman, possibly without a dollar being saved to the customer."

It is obvious that it would be impossible to measure accuratedly in dollars and cents, the value to the public of the reports issued. We know, however, that in 1881 the wheat crop of the country was a comparative failure. In order to secure this crop at the least possible cost it was necessary for those interested to convince the producers that the crop, though somewhat lighter than the preceding, was yet a heavy one, and that prices could not therefore advance. The efforts made to accomplish this purpose were prodigious. I doubt if ever in the history of the grain trade in this country was there such a determined effort as in 1881, to prove the crop a larger one than it really was. It cannot be known how far these efforts would have been successful had it not been for the crop reports published in Illinois, Ohio, and Michigan. These reports, made up from the estimates of thousands of correspondents residing in the best wheat growing sections, showed that in these States at least, the crop would not exceed one-half to two-thirds of the crop of 1880. The Department had confidence in the judgment of their correspondents, and therefore maintained persistently throughout the season, that the estimates as given in the reports were substantially correct. Note the effect these reports had upon the market. Cash No. 2 spring wheat sold in Chicgao on the 18th of July at $1 11⅞, advanced to $1 19½ at the end of the month, and did not fall below $1 19 again during the year. It frequently reached $1 38, and once touched $1 41. Of course the suddenness of the rise and the fluctuations in price are due in large part to speculation, but the rise itself must be attributed to accurate information of the immense shortage of the crop, furnished mainly, if not entirely, by the State crop reports. The average price during August was about eighteen cents higher than on the 18th of July. with these facts before us we may approximate somewhat roughly, perhaps, the benefit of the State reports to the producers of this State. The wheat crop of the State in 1881, it is now known, amounted to about 20,000,000 bushels. Of this it would take about 7,000,000 bushels for seed and to bread the farmers, leaving about 13,000,000 bushels for market.

There could have been but a small amount of the Michigan crop marketed previous to the advance in price. Suppose it to have been one or two million bushels, leaving, say eleven million or twelve million bushels that would command the advance of eighteen cents per bushel, a net increase of $2,000,000 in round numbers to the profits of our farmers. I do not forget that the price would eventually have been advanced by the dealers, but you will agree with me that such would not have been the case until after they had purchased and got possession of every bushel of the crop possible. Then they would have advanced the price and pocketed the profits. If you think my estimate too high, suppose that no more than one-half of the eleven or twelve million bushels would have gone into the hands of the dealers before they would have advanced the price, which is certainly a very low estimate, we still have left a full million dollars to the credit of the monthly reports.

In 1882 the country was again favored with a bountiful wheat harvest. In a year like that it is the province of the monthly reports to prevent the wild and exaggerated estimates that are sure to be made and to obtain credence in the absence of trustworthy information. In this the State reports were successful. Few estimates of the 1882 wheat crop of Michigan came under my notice, other than those prepared by the Secretary of State. These reports seem already to command the respect and confidence of the public, and no effort is made to controvert them. In 1882 the department was not favored with any visits of persons sent out by grain dealers, to estimate the crops, like the one mentioned in the first part of this paper as having been made in 1881. As usual, however, there were exaggerated estimates of the wheat crop of those States in which no reports are issued. This was particularly true of the Kansas and Pacific coast crops. Of the latter the exaggeration was so great that even the department at Washington, generally quite conservative in its criticisms, called attention to it.

I have now given you a very brief statement of the establishment of the State crop reporting systems, the purposes for which they were established, and the results accomplished. What of it all would I especially request that you remember!

First, That the grain dealers will have approximately accurate crop estimates whether crop reports are published by the different States or not;

Second, No other class can obtain such estimates except they be furnished by the authority and at the expense of the States;

Third, That the State crop reports have already saved to the farmers of the country an amount that can be expressed only in millions, and to the farmers of this State in 1881 alone, at least a full million dollars.

Though you may forget all else in this paper, I hope that you will not fail to remember these three facts.

After the reading of Mr. Hewett's paper, the discussion of special topics was continued, and the following resolution presented by Mr. Hammond was unanimously adopted:

That it is the sense of this convention: "That all booths, beverages, gaming devices, tent shows, and side enterprises of an immoral or intemperance character be excluded from the fair grounds of every society in the State."

It was resolved that the next meeting of the association be held at the city of Lansing, capitol building, the last Wednesday in January, 1884, at 7:30 P. M.

On motion of Mr. Sherwood, a vote of thanks was extended to President Ball and Secretary Little for their able addresses, which were solicited for publication, and for their successful management of this convention.

The following officers of the association were then chosen for the ensuing year:

OFFICERS.

President, Ben. B. Baker, Lansing; Vice-President, H. C. Sherwood, Watervleit; Secretary and Treasurer, Frank Little, Kalamazoo.

EXECUTIVE COMMITTEE.

A. C. Glidden, Paw Paw; C. M. Fellows, Manchester; D. H. English, Saranac.

ALPENA COUNTY AGRICULTURAL SOCIETY.

Report of the President, the Secretary and Treasurer, with the receipts and expenditures of the Alpena Agricultural Society for the fourth annual fair, held at the city of Alpena, October 5, 6, and 7, 1881.

The following is a statement of receipts and expenditures for the fourth year of the Alpena County Agricultural Society:

SUMMARY.

Receipts.

Received from all sources excepting county rates	$738 38
Received county, rate 1-10 mill on the dollar	485 00
Deficit balance	63 48
	$1,286 66

Disbursements.

Special A class	$142 50
Special blooded stock	14 00
Special speed premium	200 00
Department B, classes premium	97 00
" C, " "	51 25
" D, " "	10 75
" E, " "	7 75
Incidental expenses, police, etc	154 75
Permanent improvements on grounds	358 66
Interest on bonds	250 00
	$1,286 66

The Alpena County Agricultural Society was organized and incorporated August 19, 1879. The late fair resulted in awarding 160 premiums, amounting to $317.25. There were about 1,000 entries, constituting, especially in the agricultural department, a quality of farm and dairy products that set the fact that this county, notwithstanding its high northern latitude, is one of the best producing counties of the State in all the hardy grains and grasses and root crops so prominently before the people, that no denial of its general producing capacity can be entertained. In the exhibition of fruit the quantity was small, but the quality was very superior both in size and flavor. Apples, pears, plums, peaches, and grapes are being cultivated with promising success. The rapid settlement of the county is the most encouraging fact made prominent. The society occupy thirty-three acres of ground in a central and beautiful position with a beautiful river front on three sides. The grounds, where not required for other purposes, has a beautiful growth of young evergreens from five to fifteen feet in heighth which have been carefully trimmed, and at present the grounds are cleaned up and are substantially fenced, with commodious buildings and sheds for the purposes required.

The grounds with the improvements have cost the society $4,200, and a portion has been leased to a trotting park association for fifteen years, who have now finished, fenced, and built a most elegant half mile track, claimed to be, with the substantial buildings, equal to the best in the State, at a cost of $4,000. The indebtedness of the society consists of $2,400; three, four, and five years' bonds bearing interest, and the value of their property, as before stated, is $8,000. The liberality of the people, and the energy and perseverance of the officers and managers of this society, are strong considerations going to establish the fact that northeastern Michigan will not refuse to be developed.

EDWARD K. POTTER,
President.
J. K. LOCKWOOD,
Secretary.
SETH A. L. WARNER,
Treasurer.

UNION AGRICULTURAL SOCIETY.

The following is a statement of the receipts and disbursements of the Agricultural Society of Litchfield, Michigan, showing receipts and expenditures from March 20, 1881, to December 20, 1881:

RECEIPTS.

Balance in Treasurer's hands, May 29, 1881	$444 77
Received subscriptions to stock	135 00
" advertising in premium list	55 00
" 3,508 full tickets, 25c	877 00
" 367 half tickets, 10c,	36 70
" 187 double team tabs	46 50
" 381 single horse "	57 15
" money loaned	1,550 00
" rent booths, horse stalls, and all other sources	1,850 66
	$5,053 78

EXPENDITURES.

Paid printing	$97 50
" lumber	621 56
" for five acres land	750 00
" interest on land leased	128 00
" premiums, labor, hay, posts, hardware, and all other expenses	3,387 36
Cash on hand	69 36
	$5,053 78

The above is a correct statement of the receipts and expenditures of the Union Agricultural Society of Litchfield, Michigan, from March 29, 1881, to Dec. 20, 1881.

H. N. TURRELL, *Treasurer.*
L. B. AGARD, *Secretary.*
R. W. FREEMAN, *President.*

LITCHFIELD, Mich., Dec. 20, 1881.

The following is a statement showing receipts and expenditures of Union Agricultural Society, January 11th, 1881, to December 20th, 1882:

Balance in Treasurer's hands, January 11, 1881	$39 76
Total receipts from all sources	3,533 12
As follows—	
On hand	$39 76
Stock issued	15 00
Gate receipts	1,608 90
Rent of booths, and licenses, etc.	192 00
Received from Dining Hall	222 18
Money loaned	1,200 00
From all other sources	295 04
	$3,572 88

EXPENDITURES.

Printing	$104 50
Premiums	653 00
Speed premiums	262 50
Dining Hall building	600 00
Paid on indebtedness	1,126 74
Supplies and labor for Dining Hall, police, labor, amount on hand	826 14
	$3,572 88

We, the President, Secretary, and Treasurer, of the Union Agricultural Society located at Litchfield, do hereby certify that the above is a correct statement of the receipts and exenditures of said Society for the year ending December 20, 1882.

R. W. FREEMAN, *President.*
L. B. AGARD, *Secretary.*
H. N. TURRELL, *Treasurer.*

KALAMAZOO COUNTY AGRICULTURAL SOCIETY.

The annual meeting of the county agricultural society was held at the court house at 1 o'clock yesterday afternoon, being well attended.

President Wm. L. Curtis, of Richland, called the meeting to order and announced that the first business would be the report of the secretary.

Frank Little, of Kalamazoo, secretary of the society, made the following report:

Mr. President and Gentlemen:

Again we have assembled at the annual meeting of our county agricultural society, to review the business of the past year and to take such action with reference to the future as may be deemed expedient.

The year just closed has been an eventful one in the history of the nation and of the State.

A new administration had but just taken the reins of government at Washington, and the people were looking forward to a long period of rest from the turmoil incident to a great political campaign, when, on the second day of July, 1881, the chief executive and ruler was basely shot down by a cowardly assassin.

After a very painful lingering amid the intensest alternations of hope and fear of the American people and of the civilized world, on the 19th day of September, 1881, the spirit of President Garfield passed hence; his long sufferings were ended, and a nation mourned the untimely death of its chief magistrate.

Early in the month of September last, while the life current of the president was slowly ebbing away, suddenly, like the starling peal of a fire bell in the night, tidings came flashing over the wires, that the northeastern portion of Michigan bordering upon Lake Huron, was being swept with the very besom of destruction; that thousands of poor, helplers men, women, ahd children were fleeing for their lives before a devouring tempest of fire.

A scorching drought almost unprecedented in extent and duration, also prevailed throughout the northern States from the 15th of July until the middle of September. I need scarcely allude to the disastrous effects of the drought upon the growing corn, potatoes, pastures, fruit, and all grazing animals. Every farmer suffered loss and was scourged in a greater or less degree.

But a kind providence has spared us through all these afflictions, and we meet here to-day, Mr. President, full of hope, and, I trust, with a manly zeal and determination to take up the duties and responsibilities of the new year.

In presenting the merely formal annual report of the business of the Kalamazoo County Agricultural Society for the past year, allusion is herein made to some points of interest in the history and present condition of the Society, other than the tables present. For eight successive years, commencing with 1873, and preceding the fall of 1881, the annual fairs of the Society have been held at National Park in this village; and in point of excellence, I may say that these exhibitions will compare favorably with any of like character given at the same time in the State.

The Society never owned this or any other fair ground, but leased the park from year to year at a large cost for rent and repairs. At the close of the fair of 1880, the officers were advised by the owners of the grounds that under no circumstances would the lease be renewed for the coming year.

An attempt had been made in the spring of 1880 to secure an appropriation of $12,000 by tax upon the property of the county to aid in the purchase and fitting up of public grounds for the use of the Society. The heel of their disapprobation was set severely down upon this proposition by the people of the county, so much so that the officers of the Society experienced a feeling of almost criminal shame and mortification that they had in any way urged on and abetted such a movement.

Thus it seemed that in 1880 the end had been reached, and that it was simply our melancholy duty to wind up the the affairs of the Society, and with the surplus earning erect a monument over the remains.

Such was the practical situation of the Society last March, when it was learned from reliable sources that the Society could have the use of the grounds at Schoolcraft for holding the fair of 1881, and satisfactory arrangements were soon after entered into on the part of the officers of both organizations to that end.

The fair, which was held at Schoolcraft September 27 to 30, 1881, although deficient in some respects, yet as a whole was fairly credible, considering its remoteness from the northern and eastern portions of the county.

The whole number of exhibitors and of entries in the various departments as a whole, but slightly exceed one-half of the usual average. Still had the weather been favorable, it is believed that the gate money would have exceeded in amount that of the year preceding, at Kalamazoo.

The society is under obligations to the citizens of Schoolcraft and vicinity for their special efforts in its behalf. The ladies, particularly, of Schoolcraft are deserving of special mention. They labored industriously and with much enthusiasm in fitting up, decorating, and securing articles for exhibition in floral and art hall. Their success in this respect won general commendations.

It would be invidious, perhaps, where all were so faithful and efficient, to compliment the venerable superintendent in charge of the paintings, needled and fancy work, and the floral department. We consign him bodily to the tender ministrations of the fair subordinates of his division, with whom he seemed in such hearty accord.

* * * * * * * * * *

Geographically considered, Kalamazoo village is undoubted the most convenient point in the county for holding the annual fair, and here permanent grounds for that purpose should be located.

If the people of the county really desire to maintain the organization, they must in some more marked way than heretofore evidence such a wish.

The officers certainly do not want to urge the subject unduly. If the farmers and citizens of the county are unable or unwilling to place the society upon a firm basis by providing the necessary facilities for holding the annual fairs, we hope they will candidly say so.

We have no special directions or recommendations to make in reference to procuring fair grounds, save a cash purchase of a suitable piece of land, and properly fitting up the same. We would not deem it prudent to incur either collective or individual liabilities in reference to the purchase of grounds.

* * * * * * * * * * *

At the late fair, in consequence of the storm, the programme of Friday in reference to the grand cavalcade was suspended. There were also trials of speed to take place, but neither races filled, there being but one entry in the "running," and two in the "free for all."

No blame can fairly be attached to the officers for bad weather or lack of enterprise of horse owners.

* * * * * * * * * * * * * * * * * *

The following tables show the business transactions of the society for the year 1881:

EXHIBITORS.

Whole number of the fair of 1881	175

ENTRIES.

Horses in general list	80
Horses in special list	20
Cattle	56

Sheep	42
Swine	41
Poultry	40
	279
Grain, vegetables, fruits and flowers	168
Dairy, household and domestic	88
Painting, fancy work and merchandise	191
Implements, etc	42
Total of entries	768

PREMIUMS AWARDED.

Horses, general list	$148 00
Horses, special list	272 50
Cattle	157 00
Sheep	61 00
Spine	65 00
Poultry	29 50
	$733 00
Grain, vegetables, fruits and flowers	88 75
Dairy, household and domestic	48 25
Paintings, fancy work and merchandise	88 75
Implements, etc	18 60
Total of premiums awarded	$977 25

RECEIPTS FOR 1881.

Membership certificates	$175 00
Excess advertisements in pamphlet	50 00
Entrances in special classes	148 00
Rent of stands on grounds	177 50
Gate tickets—adult and child	1,185 94
Tickets, grand stand	65 44
Incidental, O. P. Morton	1 00
Interest on temporary loan	35 00
Total receipts, 1881	$1,837 88

EXPENDITURES.

Paid premium checks, fair '81	$973 25
Schoolcraft Agricultural Association	200 00
Forage—hay and straw	122 75
Prairie Ronde cornet band	50 00
Stamps, envelopes, wraps and directing	45 75
Stationery, ribbons and blanks	20 94
Assistants in treasurer's and secretary's office, etc	31 00
Police, watch, marshal and gates	67 88
Incidental expense account	73 45
Sundry disbursements	33 64
Secretary's salary and other contingencies	202 93
	$1,821 59

FINANCES.

Dr.		
Cash on hand, January 1, 1881	$1,126 10	
Receipts of 1881	1,837 88	$2,963 98
Cr.		
Paid premium checks	$ 973 65	
Paid contingent checks	848 34	
Cash on hand January 2, 1882	1,142 39	$2,963 98

In concluding my annual report, pardon an allusion, Mr. President, to this fact in the history of this association, that it is now nine years since, from a somewhat relapsed condition, certain gentlemen, whose names appear upon the journal, entered upon the work of conducting the affairs of the society.

Nine annual fairs have been held since 1873, the aggregate receipts from which including interest upon surplus, being $23,633. There has been paid out in premiums and expenses during this time an aggregate of $22,491, being the full amount of all premiums awarded, and the expenses of the several fairs, while we have now a surplus of cash in the treasury free from all obligations of any kind of $1,142.39.

The ninth annual convention of the State association of agricultural societies will be held at Paw Paw, commencing Tuesday evening, February 7, 1882. It is expected that all delegates will be entertained by the citizens of Paw Paw free of expense. I would recommend that the usual number of delegates be sent from this society.

* * * * * * * * *

In conclusion, we can all express the sincere wish that, during all the years we have devoted ourselves to the work of the society, we have not labored in vain; but that some good may have been accomplished, and the material welfare of our fellow citizens in some degree advanced through these exertions.

Respectfully submitted,
FRANK LITTLE,
Secretary Kalamazoo County Agricultural Society.

KALAMAZOO, Jan. 7, 1882.

The report of the secretary as above, was unanimously adopted.

The question of purchasing fair grounds was raised informally, a lengthy discussion ensued. Remarks were made by Mr. W. H. Cobb, B. Vosburg, A. W. Ingerson, E. R. Miller, Geo. Torrey, J. N. Stearns, Alex. Cameron, Frank Little and others.

The majority sentiment of the speakers indicated that a movement to be successful in securing means to purchase grounds, must originate with the citizens of Kalamazoo village. A few favored another submission to the people, under the act. No formal action was taken.

The society then proceeded to the election of officers. For president, Mr. W. Curtis received the unanimous vote, 30, but positively declined a reëlection. Mr. Curtis was finally excused, and the society, after experiencing some difficulty in obtaining consent, finally made choice of the following officers:

Chas. E. Morrison, of Pavilion, president; Frank Little, secretary; J. B. Cobb, treasurer. The following were elected as members of the executive committee: Orrin Snow, Willis Judson, A. W. Ingerson, Dan K. Rix.

Adjourned.

VAN BUREN COUNTY AGRICULTURAL SOCIETY.

The thirty-first Annual Fair of the Van Buren County Agricultural Society was held at Paw Paw, on Tuesday, Wednesday, Thursday, and Friday, October 4, 5, 6, and 7, 1881. The weather was unpropitious—being very rainy and cold Monday and Tuesday and the greater part of Wednesday. Notwithstanding this, about the usual number of entries were made, and the exhibits compared favorably with those of former years—in some departments being far superior.

The Board of Directors for seven years past have been experimenting somewhat in attractions other than agricultural. In 1878 Henry Ward Beecher was hired to deliver an address at an expense of $500. The receipts that year were larger than ever before in the history of the Society, and $500 was paid an the indebtedness of the Society.

In 1879 "Brick" Pomeroy was hired at an expense of $100. The receipts fell short of the Beecher year about $900. In 1880 it was decided to have no speaker; the premium list was largely increased, and a purely Agricultural

Fair was held. The receipts were something over $1,400. This year it was decided to go into a "trotting circuit," and $1,000 was offered in purses, the conditions being ten per cent of purses and five entries in each class. The classes were all filled, the best of order prevailed, and nearly all of the patrons of the Society were well satisfied with the experiment, the receipts, including entrance fees, were about $2,300.

The annual meeting of the Society was held on Tuesday, January 3d, 1882. The Treasurer of the Society submitted the following report:

RECEIPTS.

From former treasurer	$2 39
Rent of booths	127 00
Sideshows and hucksters	40 00
Life membership certificates	65 00
Donations	24 50
Rent of stalls	50 00
Sale of manure	24 00
Entry fees in horse department	321 00
Sale of tickets at gate and grand stand	1,541 67
County	100 00
Total	$2,295 56

EXPENDITURES.

For books, printing, and postage	$101 18
Posting bills, freight, etc	28 06
Meal tickets	68 50
Labor before and during fair	123 42
Interest on indebtedness	235 00
Forage	85 60
Premium orders, including special purses	1,489 20
Cash on hand	164 60
	$2,295 56

The following named gentlemen were elected for the ensuing year:

President—George D. Boyce.
Vice President—C. W. Young.
Secretary—C. A. Harrison.
Treasurer—John W. Free.
Directors for two years—O. P. Morton, E. P. Mills, J. T. Bangs, Aaron Van Auken, John Q. Adams and E. W. Herron.

Respectfully submitted,
C. W. HARRISON,
Secretary.

PAW PAW, July 3, 1882.

REGISTER

OF

METEOROLOGICAL OBSERVATIONS,

FOR THE YEAR 1881,

TAKEN AT THE

State Agricultural College of Michigan,

BY R. C. KEDZIE,

PROF. OF CHEMISTRY.

LATITUDE 42° 43′ 56″; LONGITUDE 7° 25′ 59″ WEST OF WASHINGTON.
Height above the Sea, 834 feet.

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	6	25	17	16	76	62	67	.046	,084	.063	29.130	29.105	29,082	29.106
2	16	36	27	26⅓	65	71	88	.059	.139	.129	29,064	29,042	29,112	29.073
3	25	29	17	23⅔	87	88	83	·117	.142	.078	29.145	29.215	29.225	29.195
4	17	23	17	19	100	73	83	.094	.090	.078	29,110	28,930	28.867	28.969
5	16	26	25	22⅓	82	75	87	.074	.106	.117	28.890	28.762	28.682	28.778
6	23	29	25	25⅔	100	78	87	.123	.130	.117	28.622	28.637	28.768	28.676
7	19	16	12	15⅔	84	65	80	.087	,059	.061	29.085	29.128	29.371	29.228
8	2	16	5	7⅔	100	82	75	.017	,074	.041	29.441	29.395	29.381	29.406
9	4	14	13	10⅓	74	63	62	.038	.052	.049	29.209	29.092	29.105	29.135
10	9	18	11	12⅔	78	68	79	.051	.067	.057	29.122	29.120	29.158	29.133
11	7	24	12	14⅓	76	61	80	.046	.079	.061	29,172	29.192	29.093	29.119
12	13	27	32	24	62	61	69	.019	,095	.126	29.005	28.792	28.650	28.816
13	36	36	10	27⅓	70	90	79	,149	.191	.054	28.484	28.422	28.783	28.563
14	5	-5	2	⅔	100	75	71	.034	.041	.034	29.086	29.110	29.092	29,096
15	10	15	14	13	58	47	81	.040	.041	.067	28.950	28,815	28.825	28.863
16	2	17	14	11	48	67	81	.025	,063	.067	28.991	28.975	29.138	29.035
17	1	22	5	9⅓	100	72	100	.045	,085	.055	29 451	29.533	29.624	29.536
18	-6	20	14	9⅓	100	70	100	.033	,076	.082	29.581	29.458	29.290	29.443
19	-4	31	18	15	100	68	84	.075	.119	.083	29.198	29.175	29.153	29,175
20	12	27	22	20⅓	75	64	72	.106	,095	.085	29,095	28.820	28.700	28.872
21	26	28	26	26⅔	75	88	87	.106	.136	.123	28.582	28.587	28.695	28,621
22	26	27	19	24	87	76	84	.123	.112	,087	28.788	28.854	29,032	28.891
23	15	22	18	18⅓	100	72	84	.086	.085	.083	29,090	29.135	29.235	29.153
24	16	21	16	18⅔	82	85	84	.074	,096	.087	29.218	29.178	29.153	29.183
25	17	20	14	17	83	70	82	.078	,076	.071	29.140	29.113	29,132	29.128
26	16	14	10	13⅓	82	81	79	.074	.067	.054	28.997	29.000	29.165	29.054
27	12	14	10	12	80	63	100	.061	,052	.068	29.210	29.291	29.384	29.295
28	1	20	13	11⅓	100	70	81	.045	.076	.063	29.474	29.448	29.448	29.457
29	12	17	22	17	80	83	100	.061	.078	.118	29.368	29.156	28,932	29,152
30	32	32	23	29	100	69	100	.181	.126	.123	28.915	29.060	29.130	29.035
31	17	17	12	15⅓	100	100	100	.094	.094	.075	29.233	29.211	29.143	29,196
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	16°.98	84	73	87	.075	.091	.079	--------	--------	--------	29.077
Average ------------------						81			.082		------------------------------			

THE MONTH OF JANUARY, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
95	Cu. St.	0	--------	0	--------	S W	12	S	8	S	8	26	2	------	------	------	----
0	--------	25	Cir.	100	St.	S W	8	S W	20	W	8	37	15	In Night.	------	------	----
100	Nim.	10	Cu.Cir.	0	--------	W	5	NW	4	N E	1	31	15	------	10 A. M.	.03	1½
0	--------	100	St.	0	--------	S W	2	S W	2	S W	4	25	13	------	------	------	----
100	St.	100	St.	100	Nim.	S W	1	S E	8	N E	3	26	14	7 A. M.	------	------	----
100	Nim.	100	St.	100	Cu. St.	NW	1	S W	12	W	8	29	18	------	------	------	----
100	Nim.	90	Cu.	95	Cir.Cu.	W	4	W	16	W	8	19	0	------	11 A. M.	.23	4
100	Cu. St.	25	Cir.	0	--------	----	0	W	3	----	0	18	-1	------	------	------	----
100	Cu. St.	100	St.	100	St.	----	0	NW	8	NW	4	15	2	------	------	------	----
90	Cu.	0	--------	0	--------	NW	1	W	2	----	0	21	0	------	------	------	----
75	Cir. St.	25	Cir.Cu.	0	--------	S W	1	S	3	S	1	25	4	------	------	------	----
100	St.	100	St.	25	Cir.	S E	6	S	16	S W	16	36	11	------	------	------	----
100	St.	100	Nim.	80	Cu. St.	S W	16	S W	6	NW	12	36	-7	9 A. M.	2 P. M.	.13	2
0	--------	90	Cir.Cu.	20	Cir.	----	0	W	12	----	0	9	-8	------	------	------	----
100	St.	100	Nim.	----	Hazy..	S E	8	S E	8	----	0	14	-4	8 A. M.	------	------	----
0	--------	100	St.	0	--------	----	0	----	0	----	0	16	-1	------	7 P. M.	.23	4¼
0	--------	15	Cir.Cu.	50	Cir.Cu.	----	0	----	0	----	0	24	-9	------	------	------	----
0	--------	100	Cu. St.	0	--------	E	1	N E	4	N E	5	20	-9	------	------	------	----
0	--------	10	St.	10	St.	W	16	N E	1	N	1	34	-7	------	------	------	----
100	Smoke.	100	Cir. St.	40	St.	S E	1	S E	16	N	8	28	12	------	------	------	----
100	St.	100	Nim.	100	Nim.	N	12	N	16	NW	4	28	23	7:30 A. M.	------	------	----
100	Nim.	100	Nim.	100	Nim.	N	8	NW	8	N	1	28	12	------	------	------	----
100	Nim.	100	Cu. St.	100	St.	N	1	N	12	N E	5	23	13	------	8 A. M.	1.10	11½
100	St.	100	St.	50	St.	W	2	N	3	NW	4	21	14	Flurr	ies of	Snow	----
100	St.	100	Cu. St.	100	St.	S W	8	S W	20	S W	16	21	12	Flurr	ies of	Snow	----
100	St.	100	Nim.	100	St.	W	20	W	20	W	5	15	7	7 A. M.	6 P. M.	.10	1.4
100	Nim.	90	Cu.	0	--------	W	3	NW	16	W	4	16	0	------	------	------	----
0	--------	5	Cir.Cu.	----	Hazy..	S W	4	W	12	S W	5	23	0	------	------	------	----
100	St.	100	Nim.	100	Nim.	S W	2	S E	8	S E	8	33	10	Noon.	------	------	----
100	St.	100	Cu. St.	100	St.	W	8	W	12	W	1	32	16	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N E	8	N E	8	N E	11	18	5	------	9 P. M.	.52	5½
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	2.27	30.4
70	--------	74	--------	51	--------	----	----	----	----	----	----	------	------	------	------	------	----
		65															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or per cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reeuced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7. A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	6	10	-3	4⅓	100	100	100	.257	.068	.038	29.275	29.378	29.472	29.375
2	-3	12	2	3⅔	100	100	100	.038	.075	.047	29.450	29.391	29.377	29.406
3	-3	10	-5	⅔	100	100	100	.038	.068	.034	29.447	29.430	29.493	29.457
4	3	12	6	7	100	100	100	.050	.075	.057	29.552	29.517	29.517	29.529
5	-9	24	11	8⅔	100	87	100	.028	.117	.071	29.567	29.530	29.597	29.565
6	11	32	23	22	100	79	100	.071	.144	.123	29.631	29.597	29.578	29.602
7	22	34	34	30	100	79	100	.118	.155	.196	29.465	29.332	29.289	29.362
8	37	41	37	38⅓	100	91	90	.220	.235	.199	29.134	29.063	29.093	39.097
9	41	42	41	41⅓	100	100	100	.257	.267	.257	29.038	28.843	28.650	28.844
10	35	35	33	34⅓	100	90	89	.204	.183	.168	28.581	28.755	29.009	28.782
11	32	36	33	33⅔	100	100	100	.181	.212	.188	29.111	28.005	28.798	28.971
12	34	28	22	28	100	100	100	.196	.153	.118	28.432	28.475	28.540	28.482
13	15	23	15	17⅔	100	86	100	.086	.107	.086	28.824	28.945	29.206	28.992
14	4	21	17	14	100	57	100	.052	.065	.094	29.428	29.481	29.484	29.464
15	13	26	19	19⅓	100	100	100	.078	.141	.103	29.470	29.332	29.196	29.333
16	20	22	15	19	85	72	82	.092	.085	.071	29.131	29.237	29.443	29.270
17	11	25	24	20	100	100	100	.071	.135	.129	29.480	29.433	29.357	29.423
18	23	26	21	23⅓	86	100	100	.107	.141	.113	29.109	29.018	29.098	29.075
19	10	29	16	18⅓	100	67	100	.068	.106	.090	29.253	29.302	29 317	29.291
20	19	34	32	28⅓	100	70	79	.103	.132	.144	29.205	29.116	29.081	29.134
21	22	35	25	27⅓	100	70	87	.118	.142	.117	29.180	29.224	29.187	29.197
22	28	44	31	34⅓	77	52	89	.117	.151	.155	28.969	28.898	28.926	28.931
23	6	16	12	11⅓	100	66	100	.057	.059	.075	29.167	29.312	29.340	29.273
24	2	16	14	10⅔	100	100	100	.047	.090	.082	29.303	29.051	29.000	29.118
25	-12	25	18	10⅓	100	86	100	.024	.101	.098	29.204	29.238	29.194	29.212
26	17	42	44	34⅓	100	50	84	.094	.134	.241	29.089	28.878	28.781	28.916
27	43	43	38	41⅓	100	100	91	.278	.278	.207	28.698	28.507	28.405	28.537
28	29	25	14	22⅔	100	100	100	.160	.135	.082	28.355	28.655	28.846	28.619
29	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
30	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
31	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	21°.58	98.	86.	96.	.108	.134	.124	--------	--------	--------	29.152
Average	------------------				93			.122			--------------------------------			

THE MONTH OF FEBRUARY, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Nim.	70	Cu. St.	00	--------	N	12	N	12	----	0	10	-5	------	------	------	----
70	Cu. St.	20	Cir.	60	Cir. St.	----	0	N	3	----	0	12	-12	------	------	------	----
30	Cu. St.	10	Cir. St.	10	Cir.	N	2	N	6	N	1	10	-17	------	------	------	----
100	St.	30	Cir. Cu.	00	--------	----	0	N E	4	----	0	12	-12	------	------	------	----
10	St.	40	Cir.	00	--------	----	0	----	0	E	5	25	-9	------	------	------	----
20	Cir.	60	Cir. St.	50	Cir. Cu.	E	5	E	8	E	8	36	11	------	------	------	----
40	Cir.	100	Nim.	100	Nim.	S E	12	S E	12	S E	12	37	25	9 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S E	12	S	8	S	8	41	35	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	----	0	E	6	E	12	44	35	------	------	------	----
100	Nim.	100	St.	100	St.	S W	28	S W	24	S W	16	35	30	------	12 M.	1.25	----
100	Cu. St.	100	Cu. St.	100	Nim.	----	0	E	8	E	12	35	31	5 P. M.	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	S W	8	S W	8	S W	4	34	12	------	5 A. M.	.55	2
100	Cu. St.	100	Cu. St.	00	--------	N W	12	W	16	N W	8	25	4	------	------	------	----
5	St.	5	St.	100	St.	----	0	W	2	----	0	28	4	------	------	------	----
50	St.	100	St.	70	St.	----	0	S E	3	S E	1	28	13	------	------	------	----
100	Nim.	100	Nim.	90	Cu. St.	S W	12	S W	8	S W	1	23	9	------	------	------	----
20	St.	100	St.	100	St.	S W	5	S W	2	----	0	25	8	Night.	------	------	----
100	Nim.	100	St.	100	St.	N E	6	N E	8	----	0	28	9	------	12 M.	.47	5
5	St.	00	--------	00	--------	----	0	----	0	----	0	35	9	------	------	------	----
70	Cu. St.	100	Cu. St.	100	Cu. St.	S W	4	S E	16	S E	8	34	18	------	------	------	----
00	--------	70	Cir. St.	40	St.	S W	5	S W	12	S W	8	35	21	------	------	------	----
40	Cir. St.	20	Cir. St.	100	Nim.	S E	12	S W	12	S W	12	48	6	------	------	------	----
30	St.	90	St.	100	St.	N	8	N W	8	N W	8	19	2	------	------	------	----
40	St.	100	Nim.	100	Nim.	S E	4	S E	8	N E	4	17	-12	10 A. M.	10 P. M.	.50	7
20	Cir. St.	10	St.	100	Cu. St.	----	0	S W	3	N	4	30	-12	------	------	------	----
20	St.	20	St.	70	Cu. St.	S E	8	S	12	S W	12	45	17	------	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S E	8	S E	12	S W	20	46	28	5 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	W	8	N W	12	W	8	29	10	------	8 P. M.	1.00	5
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
60	--------	74	--------	71	--------	----	----	----	----	----	----	------	------	------	------	3.77	19
			68														

METEOROLOGICAL OBSERVATIONS FOR

DAY OF MONTH.	THERMOMETER, IN OPEN AIR.				RELATIVE HUMIDITY, OR PER CENT OF SATURATION.			PRESSURE OF VAPOR, IN INCHES.			BAROMETER, REDUCED TO FREEZING POINT.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	12	25	21	19⅓	100	62	71	.075	.084	.080	28.944	28.983	29.024	28.984
2	13	30	23	22	100	57	86	.078	.095	.107	29.048	29.022	28.983	29.018
3	20	23	24	22⅓	100	100	100	.108	.123	.129	28.698	28.437	28.427	28.521
4	19	28	25	24	100	88	87	.103	.136	.117	28.502	28.549	28.529	28.527
5	31	33	31	31⅔	100	100	79	.174	.188	.137	28.520	28.660	28.813	28.664
6	31	42	31	34⅔	89	58	100	.155	.168	.174	29.043	29.090	29.189	29.107
7	19	39	30	29⅓	100	38	100	.103	.094	.167	29.258	29.256	29.156	29.223
8	29	40	35	34⅔	100	65	90	.160	.160	.183	29.038	28.960	28.942	28.980
9	26	48	34	36	100	78	79	.141	.260	.155	28.968	29.015	29.061	29.015
10	25	37	27	29⅔	100	71	100	.135	.157	.147	29.043	29.158	29.217	29.139
11	18	32	24	24⅔	84	50	100	.083	.090	.129	29.223	29.255	29.021	29.166
12	21	23	22	22	100	100	100	.113	.123	.118	28.711	28.567	28.617	28.632
13	25	35	28	29⅓	100	70	100	.135	.142	.153	28.691	28.864	29.050	28.868
14	32	42	31	35	89	50	89	.162	.297	.155	29.216	29.284	29.289	29.263
15	32	47	36	38⅓	89	92	71	.162	.297	.149	29.184	29.058	29.083	29.108
16	31	38	35	34⅔	100	72	90	.174	.165	.183	29.123	29.001	28.921	29.015
17	35	36	33	34⅔	80	61	79	.162	.129	.151	28.954	29.003	29.061	29.006
18	28	45	32	35	100	53	100	.153	.160	.181	29.076	29.015	29.058	29.050
19	32	35	34	33⅔	100	100	100	.181	.204	.196	28.831	28.405	28.365	28.534
20	34	39	32	35	100	82	100	.196	.194	.181	28.325	28.357	28.535	28.406
21	30	32	27	29⅔	89	69	100	.149	.126	.147	28.647	28.668	28.753	28.689
22	25	38	27	30	87	38	88	.117	.093	.129	28.758	28.792	28.876	28.809
23	26	40	32	32⅔	88	65	79	.123	.160	.144	28.814	28.770	28.796	28.793
24	32	42	32	35⅓	89	34	100	.168	.092	.181	28.809	28.818	28.875	28.834
25	25	37	31	31	75	63	89	.100	.136	.155	29.018	29.045	29.025	29.029
26	22	34	26	27⅓	100	70	100	.118	.139	.140	29.123	29.098	29.093	29.105
27	21	41	31	31	86	49	79	.096	.126	.137	29.139	29.051	29.126	29.105
28	26	39	33	32⅔	100	64	79	.141	.152	.151	29.016	29.010	28.983	29.003
29	24	28	25	25⅔	100	77	100	.129	.117	.135	29.001	28.953	28.883	28.946
30	24	28	30	27⅓	100	100	100	.129	.153	.167	28.716	28.652	28.666	28.67
31	29	34	27	30	89	79	100	.142	.155	.147	28.620	28.655	28.705	28.66
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	30°.28	95	70	92	.134	.152	.149	--------	--------	--------	28.899
Average						86			.145		....			

THE MONTH OF MARCH, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	00	--------	00	--------	NW	8	W	16	S W	4	32	9	------	------	------	----
90	St.	70	St.	20	Cir.Cu.	N	2	E	5	S W	8	34	12	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N E	20	N E	8	N E	16	28	17	6 A. M.	------	------	----
100	Nim.	100	Nim.	100	Nim.	S E	8	NW	8	NW	6	32	19	------	------	------	----
100	Nim.	100	Nim.	100	St.	N	12	N	8	NW	8	35	27	------	5 P. M.	1.16	7
100	St.	00	--------	00	--------	N	8	----	0	N	3	47	17	------	------	------	----
100	Fog.	20	Cir.	00	--------	S W	3	W	2	----	0	42	18	------	------	------	----
100	St.	100	St.	100	St.	----	0	N E	5	N E	4	42	25	------	------	------	----
20	St.	00	--------	00	--------	S W	1	S W	8	----	0	48	22	------	------	------	----
00	--------	----	00	100	Cu. St.	----	0	N	12	----	0	40	17	------	------	------	----
90	Cu. St.	70	Cu. St.	50	St.	N E	6	E	8	E	4	32	17	------	------	------	----
100	Cu. St.	100	Nim.	100	Cu. St.	N E	12	N E	8	----	0	25	20	8 A. M.	------	------	----
100	Nim.	90	Cu. St.	100	Nim.	----	0	S W	16	S W	12	37	25	------	9 P. M.	.52	6
100	Cu. St.	90	Cu. St.	00	--------	----	0	N	2	----	0	42	28	------	------	------	----
90	Cu. St.	00	--------	00	--------	S E	12	W	8	S W	8	50	29	------	------	------	----
90	St.	100	Cu. St.	100	Cu. St.	E	3	S E	5	N E	3	40	31	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	W	8	NW	12	NW	5	39	28	------	------	------	----
90	Cir. St.	20	Cir.Cu.	00	--------	----	0	----	0	----	0	47	26	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N E	16	E	20	E	1	37	27	6 A. M.	------	------	----
100	Nim.	100	Nim.	100	Nim.	----	0	S E	1	S W	16	39	28	------	10 P. M.	.83	2
100	Cu. St.	100	Cu. St.	100	Cu. St.	W	16	W	12	W	12	32	25	------	------	------	----
100	Cu. St.	30	Cu.	00	--------	NW	12	NW	12	S W	8	39	20	------	------	------	----
90	St.	10	St.	100	Cu. St.	W	2	NW	16	W	8	42	25	------	------	------	----
80	St.	30	Cir. St.	100	St.	W	8	W	16	S W	8	45	24	------	------	------	----
5	St.	15	St.	00	--------	N	8	W	8	----	0	42	20	------	------	------	----
5	St.	5	Cu.	00	--------	NW	12	NW	16	W	12	37	17	------	------	------	----
00	--------	00	--------	30	St.	NW	8	NW	16	W	8	40	20	------	------	------	----
60	Cu. St,	100	Cir. St.	90	St.	----	0	----	0	----	0	40	24	------	------	------	----
30	St.	100	Cu. St.	100	Cu. St.	N	12	N E	12	N	8	31	23	------	------	------	----
100	Nim.	100	Cu. St.	100	Cu. St.	N	20	N	16	N	6	34	24	5 A. M.	1 P. M.	.15	2
100	St.	100	Cu. St.	100	Cu. St.	NW	8	S W	6	NW	12	34	19	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	2.66	17
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----

67

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	19	23	23	21⅔	100	86	86	.103	.107	.107	28.871	28,975	29.100	28.982
2	14	30	26	23⅓	100	57	100	.082	.095	.141	29.214	29.176	29.125	29.172
3	23	31	27	27	100	69	88	.123	.119	.129	29.085	29.037	29.023	29.048
4	17	28	20	21⅔	100	54	100	.094	.083	.108	29.021	28.983	28.993	28.999
5	15	29	22	22	100	56	72	.086	.089	.085	28.938	28.863	28.851	28.884
6	24	35	30	29⅔	74	61	89	.095	.128	.149	28.918	29.010	29.101	29.010
7	25	47	35	35⅔	100	21	80	.135	.069	.162	29.131	29.092	29.053	29.092
8	33	48	30	37	79	49	100	.151	.166	.167	29.000	29.000	29.052	29.017
9	30	48	40	39⅓	100	49	73	.167	.166	.181	29.073	29.065	29.113	29.084
10	34	51	37	40⅔	79	34	71	.155	.126	.157	29.146	29.128	29.151	29.142
11	35	47	34	38⅔	100	62	100	.204	.202	.196	29.188	29.100	29.003	29.097
12	30	41	34	35	100	74	79	.167	.190	.155	28.941	28.965	29.002	28.969
13	31	41	35	35⅔	89	57	70	.155	.147	.142	28.968	28.963	28.993	28.975
14	31	48	37	38⅔	89	43	71	.155	.143	.157	29.003	28.925	28.895	28.941
15	35	49	40	41⅓	53	51	56	.109	.175	.138	28.803	28.795	28.980	28.859
16	34	56	44	44⅔	90	29	52	.175	.131	.151	28.988	29.055	29.115	29.053
17	46	42	43	43⅔	69	100	100	.215	.267	.278	29.145	29.100	29.022	29.089
18	41	49	39	43	100	64	73	.257	.223	.173	29.003	29.090	29.140	29.078
19	33	61	45	46⅓	89	61	76	.168	.325	.228	29.170	29.087	29.102	29.120
20	38	61	43	47⅓	63	26	75	.144	.138	.208	29.138	29.135	29.151	29.141
21	39	60	49	49⅓	82	39	78	.194	.203	.271	29.186	29.128	29.164	29.159
22	38	71	56	55	91	41	57	.207	.310	.255	29.204	29.191	29.211	29.202
23	46	76	57	59⅔	92	34	69	.286	.305	.223	29.192	29.276	29.206	29.225
24	62	82	68	70⅔	56	36	65	.338	.390	.443	29.188	29.104	29.045	29.112
25	64	71	68	67⅔	83	71	79	.497	.537	.543	28.970	28.832	28.755	28.852
26	51	70	58	59⅔	86	44	58	.308	.323	.282	28.905	28.982	29.005	28.964
27	52	62	48	54	73	56	70	.282	.312	.236	28.968	28.955	29.050	28.991
28	42	60	54	52	83	49	67	.221	.255	.282	29.126	29.053	29.035	29.071
29	44	54	44	47⅓	84	38	52	.241	.157	.177	29.158	29.218	29.298	29.225
30	38	60	52	50	63	65	54	.144	.338	.207	29.427	29.363	29.326	29.372
------	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	45.59	86	53	75	.188	.207	.204	--------	--------	--------	29.064
Average..................					71			.200			------------------------------			

THE MONTH OF APRIL, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning Rain or Snow.	Ending Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Nim.	100	Cu. St.	90	Cu. St.	N W	12	N W	12	N W	12	25	9	In night.	5 P. M.	.25	3
80	St.	80	Cir. Cu.	90	Cu. St.	----	0	W	8	----	0	35	14	------	------	------	----
100	St.	100	St.	50	St.	N W	1	W	3	N W	1	34	16	------	------	------	----
00	--------	100	Cu. St.	00	--------	N W	8	N W	12	N W	8	31	12	------	------	------	----
5	St.	15	Cu.	40	St.	N W	7	W	28	W	8	31	14	------	------	------	----
100	Nim.	30	Cu.	00	--------	N W	8	N W	12	----	0	41	21	------	------	------	----
00	--------	10	St.	10	St.	W	1	S W	1	----	0	52	24	------	------	------	----
30	St.	40	Cu.	00	--------	N E	8	N E	12	N E	4	48	25	------	------	------	----
15	St.	15	St.	20	St.	N E	4	N E	8	N E	1	52	30	------	-----	------	----
00	--------	100	St.	100	St.	W	3	N W	16	----	0	53	33	------	------	------	----
100	Cu. St.	60	Cu. St.	100	Nim.	S W	2	S W	6	S	2	52	29	5 P. M.	Night	.33	2
100	Cu. St.	80	Cu. St.	100	Cu. St.	N E	8	N E	12	N	6	44	29	In	Night.	.02	¼
20	St.	80	Cu.	00	--------	N E	8	N	12	----	0	43	26	------	------	------	----
10	Cir.	100	Cu. St.	20	Cu. St.	----	0	S W	4	----	0	51	29	------	------	------	----
40	St.	30	Cu. St.	20	Cir. St.	E	3	E	12	N W	8	52	32	------	------	------	----
00	--------	10	Cu.	00	--------	N W	8	N W	12	W	6	58	34	------	------	------	----
100	St.	100	Nim.	100	Nim.	S W	2	S W	4	N E	6	50	40	12 M.	------	------	----
100	Nim.	20	Cir. Cu.	00	--------	E	8	N E	8	N E	8	53	29	------	9 A. M.	1.10	----
10	Cir.	30	Cir. St.	90	Cir. St.	N E	2	S E	8	S E	3	64	33	------	------	------	----
10	Cir.	20	Cir.	00	--------	N E	2	E	4	----	0	64	33	------	------	------	----
90	Cir. St.	90	Cu. St.	90	Cir. St.	----	0	E	1	----	0	60	34	------	------	------	----
10	Cir.	40	Cu.	00	--------	----	0	W	12	----	0	72	37	------	------	------	----
00	--------	20	Cir.	00	--------	----	0	S W	12	----	0	77	44	------	------	------	----
10	St.	50	St.	100	Cu. St.	S W	4	S W	8	----	0	83	60	------	------	------	----
100	Cu. St.	100	Nim.	100	Cu. St.	S W	8	S W	8	N E	6	76	49	Show	er.	.03	----
70	Cu. St.	10	St.	00	--------	N	12	N W	3	----	0	74	47	------	------	------	----
70	St.	100	Cu. St.	00	--------	S W	12	W	16	S W	8	65	37	------	------	------	----
80	Cir. St.	100	Cu. St.	100	Cu. St.	S W	6	S W	12	N W	6	64	42	------	------	------	----
80	Cir.	85	Cu. St.	00	--------	----	0	W	16	----	0	57	31	------	------	------	----
00	--------	30	Cu. St.	00	--------	----	0	S W	6	S W	12	63	37	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	1.73	5¼
48	--------	58	--------	41	--------	----	----	----	----	----	----	------	------	------	------	------	----
		49															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	47	65	57	56⅓	62	44	87	.202	.372	.407	29.222	29.128	29.120	29.157
2	45	60	47	50⅔	92	44	62	.275	.229	.202	29.254	29.296	29.363	29.304
3	40	64	48	50⅔	65	43	56	.160	.257	.189	29.442	29.398	29.396	29.412
4	41	66	50	52⅓	65	47	58	.168	.270	.209	29.452	29.378	29.299	29.376
5	49	59	55	54⅓	71	76	87	.247	.380	.376	29.193	29.051	29.038	29.094
6	52	73	60	61⅔	86	43	71	.234	.345	.367	29.108	29.118	29.105	29.110
7	60	78	65	67⅔	77	54	100	.396	.514	.617	29.130	29.092	29.030	29.084
8	67	82	72	73⅔	89	42	58	.591	.460	.455	29.072	28.974	28.977	29.008
9	70	77	64	70⅓	70	65	100	.516	.601	.596	29.025	28.974	28.970	28.990
10	65	73	70	69⅓	94	72	85	.583	.581	.622	28.972	28.972	29.017	28.987
11	70	83	76	76⅓	85	64	73	.622	.718	.652	29.105	29.112	29.102	29.106
12	72	85	73	76⅔	90	64	67	.706	.775	.545	29.148	29.157	29.190	29.165
13	60	79	60	68⅔	82	47	74	.426	.465	.470	29.283	29.225	29.115	29.208
14	62	68	62	64	88	100	94	.491	.685	.523	29.012	28.782	28.880	28.891
15	57	55	54	55⅓	75	68	87	.350	.361	.362	28.791	28.811	28.923	28.842
16	52	71	60	61	100	66	55	.388	.503	.282	29.073	29.063	29.118	29.085
17	52	66	52	56⅔	66	32	66	.257	.229	.257	29.153	29.148	29.158	29.153
18	52	67	54	57⅔	73	50	80	.282	.333	.335	29.140	29.110	29.120	29.123
19	50	70	56	58⅔	100	53	94	.361	.385	.420	29.095	29.038	29.020	29.051
20	53	72	60	61⅔	100	50	71	.403	.390	.367	29.045	29.028	29.032	29.035
21	52	77	62	63⅔	86	46	61	.334	.442	.340	29.201	29.110	29.148	29.153
22	55	73	62	63⅓	93	50	72	.404	.409	.399	29.264	29.205	29.248	29.239
23	60	81	67	69⅓	83	55	74	.456	.585	.489	29.366	29.285	29.328	29.324
24	62	83	66	70⅓	83	46	95	.460	.447	.604	29.351	29.322	29.292	29.322
25	64	87	69	73⅓	78	31	90	.465	.393	.635	29.311	29.252	29.255	29.273
26	64	88	69	73⅔	89	34	75	.529	.480	.529	29.285	29.214	29.238	29.243
27	65	89	70	74⅔	84	35	89	.516	.477	.591	29.265	29.039	29.047	29.117
28	67	86	66	73	84	45	84	.556	.556	.536	29.015	28.929	28.914	28.953
29	70	89	73	77⅓	75	35	76	.550	.477	.618	28.935	28.884	28.887	28.902
30	69	85	63	72⅓	90	54	100	.635	.650	.576	28.927	28.939	28.970	28.945
31	60	81	62	67⅔	100	63	94	.518	.663	.523	28.982	28.934	28.952	28.956
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	65°.24	83	52	79	.422	.466	.455	--------	--------	--------	29.116
Average ------------------						71			.448		------------------------------------			

THE MONTH OF MAY, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOME'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	100	Cu. St.	100	Cu. St.	S	8	W	12	----	0	66	44	------	------	------	----
20	St.	20	Cu.	00	--------	N	12	N E	8	----	0	62	33	------	------	------	----
00	--------	00	--------	00	--------	E	4	E	3	----	0	66	36	------	------	------	----
10	Cir. St.	70	Cir. St.	100	St.	E	4	S W	8	E	3	68	40	------	------	------	----
100	Cir. St.	100	Cu. St.	100	Cu. St.	E	3	E	8	----	0	65	46	------	------	------	----
00	--------	30	Cu.	100	Cir. St.	----	0	N	4	----	0	76	47	------	------	------	----
00	--------	40	Cu.	00	--------	S	6	S	8	S	8	81	57	------	------	------	----
30	Cu. St.	60	Cu.	100	Cu. St.	S	12	S	20	----	0	85	62	------	------	------	----
70	Cir. St.	100	Cir. Cu.	100	Cu. St.	S W	12	W	16	S W	1	77	62	3 P. M.	12 P. M.	.95	----
100	Cu. St.	60	Cir. Cu.	00	--------	S	6	S W	16	S	8	75	64	8 A. M.	11 A. M.	.15	----
30	Cu.	70	Cu.	30	Cu.	S W	12	S W	12	----	0	85	68	------	------	------	----
20	St.	50	Cu.	10	Cu.	S W	12	S W	16	----	0	88	58	------	------	------	----
90	Cu. St.	30	Cir. Cu.	60	Cir. Cu.	E	3	S E	2	----	0	82	58	------	------	------	----
10	St.	100	Nim.	00	--------	S W	8	S W	10	----	0	78	52	2 P. M.	4 P. M.	.66	----
00	--------	100	Cu. St.	40	St.	W	12	W	16	N W	8	58	43	------	------	------	----
00	--------	20	Cu.	00	--------	N	8	N	8	N E	1	72	44	------	------	------	----
00	--------	10	St.	00	--------	N	6	N	16	N E	1	67	43	------	------	------	----
20	St.	90	Cir. St.	00	--------	N	4	S W	8	----	0	68	44	------	------	------	----
10	St.	20	Cu.	00	--------	N E	2	E	8	----	0	71	47	------	------	------	----
70	St.	30	Cu. St.	00	--------	E	4	N W	6	----	0	75	47	------	------	------	----
10	St.	15	Cu.	00	--------	----	0	E	5	E	2	77	50	------	------	------	----
100	Cu. St.	5	Cu.	00	--------	N E	3	E	6	----	0	76	52	------	------	------	----
00	--------	10	Cu.	00	--------	----	0	N E	6	----	0	84	53	------	------	------	----
00	--------	00	--------	00	--------	E	4	E	7	----	0	85	53	------	------	------	----
00	--------	00	--------	00	--------	----	0	S W	4	----	0	88	55	------	------	------	----
00	--------	20	Cu.	20	Cu.	S W	4	----	0	----	0	89	59	------	------	------	----
60	Cu. St.	30	Cu. St.	00	--------	S W	2	S W	8	----	0	89	60	------	------	------	----
40	St.	50	Cu. St.	00	--------	S W	1	S W	4	----	0	87	62	------	------	------	----
20	St.	40	Cu.	90	Cu. St.	S W	2	N W	8	----	0	89	62	------	------	------	----
50	Cu. St.	20	Cir. St.	50	Cu. St.	W	4	----	0	E	1	86	55	6 P. M.	7 P. M.	.35	----
50	Cu. St.	70	Cu. St.	100	Cu. St.	E	2	S E	6	E	1	81	54	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	---	----	------	------	------	------	2.11	----
33	--------	44	--------	34	--------	----	----	----	----	----	----	------	------	------	------	------	----
		37															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	56	71	61	62⅔	100	58	83	.449	.436	.443	28.962	28.937	28.962	28.954
2	52	71	60	61	86	66	77	.334	.503	.396	28.935	28.832	28.760	28.842
3	55	63	56	58	77	67	81	.376	.386	.363	28.745	28.848	28.950	28.848
4	52	74	62	62⅔	73	43	56	.282	.363	.312	29.053	29.032	28.990	29.025
5	58	62	54	58	88	77	87	.422	.429	.362	28.903	28 910	28.968	28.927
6	47	65	57	56⅓	62	73	81	.202	.451	.378	29.098	29.045	29.068	29.070
7	53	59	58	56⅔	100	88	94	.403	.439	.452	28.888	28.895	28.933	28.905
8	56	62	58	58⅔	100	88	94	.449	.491	.452	28.903	28.900	28.948	28.917
9	54	68	52	58	87	65	66	.362	.443	.257	29.035	29.100	29.171	29.102
10	46	69	56	57	100	56	100	.311	.398	.449	29.239	29.193	29.176	29.203
11	56	78	67	67	94	43	64	.420	.409	.425	29.206	29.135	29.095	29.145
12	65	72	70	69	89	90	100	.549	.706	.733	29.105	29.067	29.020	29.064
13	69	82	67	72⅔	85	56	74	.599	.610	.489	28.920	28.892	28.932	28.915
14	64	80	65	69⅔	89	44	68	.529	.452	.420	28.992	29.044	29.143	29.060
15	63	81	65	69⅔	83	48	100	.478	.510	.617	29.231	29.248	29.260	29.246
16	60	73	69	67⅓	94	76	100	.487	.604	.708	29.204	29.034	28.877	29.038
17	67	81	63	70⅓	95	45	67	.626	.474	.386	28.907	28.947	29.007	28.954
18	63	84	66	71	83	47	95	.478	.545	.604	28.995	28.944	28.852	28.930
19	63	79	67	69⅔	94	70	89	.542	.690	.591	28.957	28.950	28.915	28.941
20	62	70	61	64⅓	88	66	61	.491	.482	.325	28.927	28.972	29.020	28.973
21	50	65	54	56⅓	86	54	87	.309	.330	.362	29.085	29.093	29.078	29.085
22	52	65	59	58⅔	86	49	76	.334	.300	.380	29.092	29.060	29.072	29.073
23	50	63	55	56	93	57	81	.335	.327	.349	29.172	29.206	29.226	29.201
24	52	72	62	62	79	50	77	.308	.390	.429	29.262	29.214	29.166	29.214
25	56	68	63	62⅓	100	60	94	.449	.411	.342	29.125	29.098	29.118	29.114
26	62	72	66	66⅔	88	71	84	.491	.559	.536	29.181	29.148	29.058	29.129
27	63	74	72	69⅔	100	76	95	.576	.641	.745	28.821	28.815	28.837	28.824
28	70	86	78	78	100	61	86	.733	.762	.827	28.832	28.799	28.832	28.821
29	72	86	68	75⅓	90	61	70	.706	.596	.476	28.935	28.909	28.964	28.936
30	60	70	64	64⅔	100	66	78	.518	.482	.465	29.057	29.077	29.117	29.084
31	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	64°.31	90	62	82	.452	.487	.476	--------	--------	--------	29.018
Average						73			.472		--------			

THE MONTH OF JUNE, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Nim.	70	Cu.	00	--------	N E	3	N E	8	N E	1	72	47	In night.	8 A. M.	.75	----
5	St.	90	Cu. St.	20	Cir. St.	N	1	S E	6	----	0	71	53	------	------	------	----
100	Cu. St.	80	Cu. St.	00	--------	N	4	N E	8	----	0	69	47	------	------	------	----
00	--------	30	Cir.	20	Cir.	N	4	N	1	----	0	75	52	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	W	1	----	0	N E	4	65	44	------	------	------	----
100	Cu. St.	90	Cu. St.	80	Cir. St.	N E	4	N E	3	N E	4	65	46	5 A. M.	------	------	----
100	Nim.	100	Cu. St.	100	Cu. St.	E	1	----	0	----	0	60	53	------	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	N E	1	N E	3	N	4	62	48	------	5 P. M.	7.02	----
10	St.	60	Cir. Cu.	00	--------	N	8	N	8	N	1	68	40	------	------	------	----
00	--------	40	Cir. St.	20	Cir.	N	1	N W	2	----	0	75	45	------	------	------	----
30	Cir. St.	20	Cir.	50	Cir. St.	S E	5	S W	8	S E	8	79	56	------	------	------	----
100	Nim.	100	Nim.	10	St.	S	8	S	2	----	0	77	63	7 A. M.	3 P. M.	.10	----
10	St.	60	Cu.	10	Cu.	S W	16	S W	20	----	0	82	58	------	------	------	----
00	--------	30	Cu.	00	--------	W	9	N W	16	----	0	80	56	------	------	------	----
20	St.	50	Cir. St.	100	Nim.	N E	3	E	2	----	0	81	57	8 P. M.	6 A. M.	.15	----
100	Cu. St.	80	Cu. St.	100	Nim.	S	8	S E	8	E	12	76	58	5 P. M.	------	------	----
100	Cu. St.	20	Cir. St.	00	--------	NW	8	W	16	----	0	82	54	------	5 A. M.	.96	----
00	--------	30	Cir. St.	00	--------	S W	2	----	0	----	0	84	58	5 P. M.	6 P. M.	.08	----
100	Cu. St.	60	Cir. St.	30	St.	NW	3	W	12	----	0	80	60	------	------	------	----
100	Cu. St.	100	Cu. St.	30	St.	N	4	N	3	N E	3	71	48	------	------	------	----
60	--------	100	Cu. St.	10	St.	N	4	N E	8	N	1	66	43	------	------	------	----
60	Cu. St.	80	Cu.	100	Cu. St.	N E	1	N E	2	N E	1	69	44	------	------	------	----
100	Cu. St.	90	Cu. St.	30	Cu. St.	N E	4	N E	2	N	1	66	45	------	------	------	----
10	St.	80	Cu. St.	20	St.	N E	2	N	1	----	0	73	52	------	------	------	----
100	Nim.	30	Cu. St.	100	Cu. St.	E	4	S W	8	N E	1	68	55	5 A. M.	11 A. M.	.58	----
100	Cu. St.	80	Cu. St.	100	Cu. St.	----	0	S E	8	----	0	73	60	------	------	------	----
100	Nim.	80	Cu.	100	Cu. St.	S E	2	S W	12	NW	1	74	62	3 A. M.	8 A. M.	.61	----
100	Nim.	80	Cu. St.	60	Cu. St.	S W	8	W	12	S W	6	86	69	4 A. M.	7 A. M.	.12	----
100	Cu. St.	20	Cir. St.	00	--------	W	2	W	8	----	0	86	57	------	------	------	----
30	St.	70	Cu. St.	00	--------	N	3	N E	2	----	0	71	52	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	4.37	----
63	--------	67	--------	43	--------	----	----	----	----	----	----	------	------	------	------	------	----
58																	

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or per cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7. A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	60	78	63	67	82	50	94	.426	.478	.342	29.298	29.313	29.268	29.293
2	59	83	70	70⅔	100	60	70	.500	.677	.516	29.351	29.310	29.273	29.311
3	67	80	72	73	79	66	71	.522	.677	.559	29.281	29.250	29.185	29.239
4	66	87	73	75⅓	95	49	81	.604	.623	.655	29.185	29.107	29.092	29.128
5	73	91	81	81⅔	90	47	70	.731	.694	.745	29.077	29.036	29.052	29.055
6	73	89	79	80⅓	85	63	78	.693	.855	.772	29.144	29.121	29.099	29.121
7	65	80	75	73⅓	100	78	95	.617	.800	.745	29.114	29.047	29.037	29.066
8	72	90	75	79	100	70	90	.784	.983	.784	29.077	29.021	29.072	29.057
9	79	93	78	83⅓	82	52	100	.814	.800	.958	29.104	29.105	29.131	29.113
10	70	83	67	72⅓	75	62	89	.550	.637	.591	29.170	29.144	29.175	29.163
11	65	83	72	73⅓	84	56	90	.516	.636	.706	29.231	29.170	29.112	29.171
12	74	83	79	78⅔	95	87	74	.798	.932	.730	29.057	28.972	28.992	29.007
13	75	88	77	80	90	52	57	.784	.692	.527	29.070	29.086	29.124	29.093
14	63	81	67	70⅓	94	59	89	.542	.324	.591	29.192	29.194	29.215	29.200
15	67	90	73	76⅔	79	50	95	.522	.708	.771	29.243	29.143	29.114	29.167
16	75	83	76	78	86	64	49	.744	.718	.436	29.087	29.032	29.057	29.059
17	67	80	66	71	64	48	59	.425	.487	.376	29.097	29.074	29.050	29.074
18	63	84	67	71⅓	72	37	64	.416	.434	.425	29.052	28.989	28.972	29.004
19	63	86	71	73⅓	89	42	66	.510	.518	.503	28.968	28.937	28.920	28.942
20	65	80	70	71⅔	89	59	100	.549	.598	.733	28.905	28.879	28.910	28.898
21	67	84	73	74⅔	100	47	63	.662	.545	.510	28.920	28.917	28.947	28.928
22	63	80	66	69⅔	94	59	95	.542	.598	.604	28.907	28.937	28.985	28.943
23	63	84	70	72⅓	94	47	70	.542	.545	.516	29.027	29.022	29.012	29.020
24	68	85	72	75	74	44	76	.509	.531	.595	29.012	28.952	28.950	28.971
25	64	72	66	67⅓	89	54	69	.529	.422	.438	28.940	28.922	28.950	28.937
26	60	74	62	65⅓	82	59	77	.426	.497	.429	29.028	29.032	29.072	29.043
27	59	81	70	70	76	38	53	.380	.403	.385	29.075	29.042	29.070	29.062
28	59	82	65	68⅔	76	37	73	.380	.425	.451	29.140	29.092	29.129	29.120
29	59	83	67	69⅔	88	46	89	.439	.520	.591	29.198	29.180	29.208	29.195
30	66	86	65	72⅓	100	48	94	.639	.623	.583	29.285	29.264	29.255	29.268
31	66	82	65	71	89	52	100	.569	.572	.617	29.271	29.244	29.225	29.247
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	73.°14	87.	54.	79.	.570	.613	.586	--------	--------	--------	29.093
Average	-------------------				73			.590			-------------------------			

THE MONTH OF JULY, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
00	--------	40	Cir.	00	--------	N E	1	N E	1	----	0	80	53	------	------	------	----
00	--------	00	--------	00	--------	N E	3	W	6	----	0	83	58	------	------	------	----
70	Cu. St.	70	Cu. St.	20	St.	S W	3	W	6	----	0	82	63	------	------	------	----
00	--------	10	Cu.	00	--------	----	0	W	8	----	0	88	67	------	------	------	----
00	--------	20	Cu.	20	St.	W	8	S W	12	----	0	91	70	------	------	------	----
00	--------	50	Cu.	60	Cu. St.	N	1	N	1	----	0	91	62	------	------	------	----
100	Nim.	100	Cu. St.	60	Cu. St.	N W	2	S W	4	----	0	81	64	5 A. M.	10 A. M.	.40	----
100	St.	30	Cu.	00	--------	S E	4	W	8	----	0	91	71	------	------	------	----
00	--------	40	Cu.	10	Cir.	S W	4	W	8	----	0	95	67	------	------	------	----
100	St.	50	Cu. St.	20	Cir.	N E	2	N	2	----	0	81	62	------	------	------	----
100	Cu. St.	60	Cu. St.	50	Cu. St.	N E	1	S W	3	N W	1	83	64	------	------	------	----
00	--------	40	Cu.	80	Cir. St.	S E	4	S	6	----	0	89	72	11 A. M.	12 M.	.26	----
100	St.	40	Cir. Cu.	10	St.	S W	3	N	5	----	0	88	57	------	------	------	----
100	St.	100	Cir. St.	10	St.	N	1	N W	1	----	0	82	57	------	------	------	----
00	--------	20	Cir.	----	0	N E	1	S E	4	----	0	90	65	------	------	------	----
100	Cu. St.	90	Cu.	80	Cir. St.	S W	4	N W	8	N W	1	86	67	------	------	------	----
40	Cir. Cu.	20	Cu.	00	--------	N	5	N	5	N	3	80	52	------	------	------	----
70	St.	40	Cu.	00	--------	N W	4	N W	8	----	0	85	57	------	------	------	----
10	St.	20	Cu.	00	--------	W	4	W	12	----	0	86	62	------	------	------	----
90	Cu. St.	100	Cu. St.	100	Cu. St.	S W	3	S W	3	----	C	80	65	3 P. M.	12 M.	.18	----
90	St.	90	Cir. St.	100	St.	----	0	N E	7	E	4	85	59	10 P. M.	------	------	----
100	Cu. St.	40	Cu.	00	--------	N	3	N E	4	----	0	81	58	------	9 A. M.	.72	----
00	--------	30	Cu.	00	--------	----	0	W	7	----	0	85	57	------	------	------	----
00	--------	90	Cu.	20	St.	S W	3	S W	5	----	0	86	58	------	------	------	----
10	Cu.	40	Cu.	90	Cu.	S W	6	S W	16	S W	4	77	57	------	------	------	----
30	Cu.	100	Cu. St.	00	--------	N W	8	S W	12	----	0	76	57	------	------	------	----
10	St.	90	Cu.	10	St.	N W	3	N	12	N	4	82	52	------	------	------	----
00	--------	50	Cu.	00	--------	W	4	N	6	----	0	82	52	------	------	------	----
10	Cir.	30	Cu.	00	--------	N	1	N E	8	----	0	83	56	------	------	------	----
00	--------	40	Cu.	00	--------	N E	1	N	2	----	0	86	56	------	------	------	----
00	--------	90	Cu. St.	00	--------	E	1	N E	1	E	1	82	60	3 P. M.	10 P. M.	.25	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
38	--------	53	--------	21	--------	----	----	----	----	----	----	------	------	------	------	1.81	----
38																	

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, In Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	65	83	72	73⅓	100	63	85	.617	.636	.658	29.233	29.184	29.152	29.190
2	66	91	75	77⅓	95	39	68	.604	.569	.591	29.180	29.159	29.129	29.156
3	70	91	75	78⅔	90	39	72	.658	.542	.628	29.195	29.131	29.127	29.151
4	76	96	81	84⅓	73	48	83	.652	.596	.873	29.160	29.093	29.111	29.121
5	73	100	79	84	85	30	70	.693	.572	.690	29.150	29.087	29.057	29.096
6	70	78	66	71⅓	100	73	100	.733	.704	.639	29.087	29.057	29.084	29.076
7	63	75	63	67	89	90	83	.510	.784	.478	29.168	29.148	29.173	29.163
8	56	77	68	67	94	49	65	.420	.457	.503	29.196	29.107	29.012	29.105
9	63	88	76	75⅔	89	56	73	.510	.735	.652	28.905	28.876	28.912	28.898
10	67	81	63	70⅓	84	52	89	.556	.534	.510	29.010	29.029	29.057	29.032
11	60	74	72	68⅔	94	68	76	.487	.568	.595	29.082	29.060	28.960	29.034
12	75	95	75	81⅔	60	36	52	.519	.597	.449	28.880	28.841	28.874	28.865
13	67	75	62	68	74	56	72	.489	.483	.399	28.940	28.954	29.062	28.985
14	60	74	59	64⅓	77	47	76	.396	.396	.380	29.132	29.163	29.248	29.181
15	54	77	59	63⅓	87	46	70	.362	.422	.351	29.304	29.253	29.246	29.268
16	54	84	71	69⅔	87	37	58	.362	.434	.436	29.252	29.122	29.110	29.162
17	67	78	71	72	74	50	58	.489	.478	.436	29.107	29.067	28.990	29.055
18	64	68	65	65⅔	89	79	89	.529	.543	.549	28.995	28.922	28.955	28.957
19	64	70	69	67⅔	94	80	89	.562	.586	.591	29.017	29.005	29.005	29.009
20	66	70	68	68	95	85	84	.604	.622	.577	28.997	28.947	28.942	28.962
21	62	77	65	68	89	46	63	.491	.422	.389	28.987	28.989	29.032	29.003
22	58	80	66	68	70	37	74	.336	.382	.470	29.148	29.160	29.191	29.166
23	56	78	65	66⅓	94	50	73	.420	.478	.451	29.246	29.240	29.235	29.240
24	60	84	67	70⅓	88	44	69	.456	.534	.457	29.356	29.335	29.305	29.332
25	58	80	66	68	88	41	79	.422	.417	.502	29.346	29.312	29.275	29.311
26	57	88	76	73⅔	87	31	56	.407	.416	.505	29.241	29.179	29.145	29.188
27	73	86	72	77	85	48	85	.693	.596	.668	29.175	29.174	29.144	29.164
28	70	94	72	78⅔	90	31	80	.658	.488	.631	29.218	29.153	29.181	29.184
29	67	94	79	80	89	38	62	.591	.611	.612	29.235	29.208	29.191	29.211
30	75	96	83	84⅔	77	34	56	.666	.584	.409	29.255	29.188	29.169	29.204
31	79	87	76	80⅔	66	52	82	.651	.664	.731	29.167	29.166	29.114	29.140
Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	72°.69	86	51	74	.533	.544	.542	--------	--------	--------	29.107
Average ----------------						70			.540		----------------------------			

THE MONTH OF AUGUST, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
haze	--------	10	Cir.	20	St.	----	0	N	1	----	0	83	62	------	------	------	----
100	St.	30	Cu.	20	Cir. St.	----	0	S W	5	----	0	96	65	------	------	------	----
20	Cir.Cu.	40	Cu.	00	--------	----	0	S W	8	----	0	96	69	------	------	------	----
00	--------	30	Cir.	00	--------	NW	3	W	12	----	0	96	66	------	------	------	----
00	--------	30	Cu.	20	St.	----	0	S W	12	N	1	100	68	------	------	------	----
100	Nim.	90	Cu. St.	100	Nim.	E	2	N	4	N E	1	80	60	3 A. M. 7 P. M.	9 A. M. 11 P.M.	.46 .55	----
50	Cu.	50	Cu.	5	Cu.	N E	1	S W	2	----	0	76	51	------	------	------	----
00	--------	30	Cir.Cu.	70	Cir.Cu.	N	1	S W	8	S W	8	76	55	------	------	------	----
100	Nim.	10	Cu.	00	--------	S W	8	W	12	----	0	88	62	5 A. M.	9 A. M.	.10	----
00	--------	10	Cu.	00	--------	N	4	N E	5	----	0	81	56	------	------	------	----
30	St.	100	Cu. St.	10	St.	N	1	S E	2	S E	6	76	58	------	------	------	----
10	Cir.	30	Cir.Cu.	00	--------	S W	7	S W	12	----	0	95	62	------	------	------	----
30	St.	90	Cir.Cu.	100	St.	W	3	N E	8	N	8	77	55	------	------	------	----
100	Cu. St.	30	Cu.	00	--------	N	5	N E	5	----	0	75	52	------	------	------	----
00	--------	00	--------	00	--------	N	1	N E	4	----	0	73	46	------	------	------	----
00	--------	10	Cu.	00	--------	N E	4	E	6	S E	8	81	49	------	------	------	----
100	Cu. St.	90	Cu. St.	5	St.	S E	6	S E	6	S E	8	85	54	In Night.	------	------	----
100	Nim.	100	Cu. St.	100	St.	S E	8	S E	10	S E	4	82	54	-----	1 P. M.	.52	----
100	St.	100	Cu. St.	100	Cu. St.	N E	3	N E	2	N E	2	67	62	------	------	------	----
100	St.	100	Cu. St.	90	Cu. St.	N E	2	N E	4	N E	6	70	64	------	------	------	----
15	Cu.	15	Cu.	00	--------	N E	3	N	6	N E	7	76	60	------	------	------	----
00	--------	40	Cu.	60	Cu. St.	N E	4	N E	1	----	0	80	52	------	------	------	----
50	Cu.	40	Cu.	00	--------	----	0	S W	1	----	0	81	54	------	------	------	----
70	Cu. St.	20	Cu.	00	--------	NW	1	S	4	----	0	84	52	------	------	------	----
00	--------	10	Cir.	00	--------	----	0	N E	3	----	0	80	52	------	------	------	----
70	St.	90	St.	00	--------	E	1	S	4	S	1	88	56	------	------	------	----
100	Nim.	90	Cu. St.	00	--------	----	0	S W	1	----	0	86	65	------	------	------	----
Sm	okey.	Sm	okey.	00	--------	S W	1	S	1	----	0	96	64	------	------	------	----
Sm	okey.	Sm	okey.	00	--------	----	0	S E	8	----	0	94	67	------	------	------	----
00	--------	30	Cu. St.	00	--------	S E	3	----	0	S	4	97	74	------	------	------	----
30	St.	100	Cu. St.	40	Cu. St.	S W	4	S W	12	----	0	92	69	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	1.63	----
46	--------	49	--------	24	--------	----	----	----	----	----	----	------	------	------	------	------	----
		40															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P, M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	74	80	68	74	76	62	69	.641	.637	.476	29.109	29,097	29.081	29,096
2	69	79	69	72⅓	90	62	90	.635	.612	.635	29.120	29,072	29.067	29,086
3	62	80	66	69⅓	94	55	89	.523	.561	.569	29.067	29,042	29.057	29,055
4	70	85	73	76	85	44	76	.622	.531	.618	28,982	28,922	28.885	28.930
5	77	96	82	85	77	32	56	.718	.542	.610	29,004	29.021	29.066	29,030
6	77	97	84	86	65	33	47	.601	.570	.545	29.152	29.095	29.089	29.117
7	78	86	65	76⅓	65	58	68	.625	.719	.420	29,130	29,149	29.213	29.164
8	62	89	73	74⅔	77	53	81	.429	.721	.655	29.225	29.091	29.144	29.153
9	63	77	61	67	83	46	82	.478	.422	.443	29.203	29.142	29.135	29.160
10	59	82	58	66⅓	94	52	94	.469	.572	.452	29.062	28,812	28.897	28.924
11	55	70	53	59⅓	81	40	61	.349	.293	.244	29.179	29.176	29.181	29.179
12	53	72	61	62	80	50	77	.321	.390	.412	29.172	29.077	29.158	29.136
13	45	72	56	57⅔	100	50	81	.299	.390	.363	29.274	29.235	29.236	29.248
14	52	76	64	64	93	41	63	.361	.369	.373	29,222	29.125	29.052	29.133
15	62	66	67	65	88	89	95	.491	.529	.626	28.998	28.798	28.685	28,827
16	62	61	57	60	100	82	100	.556	.443	.466	28.815	29.013	29.075	28.968
17	56	68	59	61	87	42	76	.391	.290	.380	29.234	29.251	29.284	29,256
18	55	82	62	66⅓	87	39	72	.376	.425	.399	29.326	29.278	29.216	29.273
19	54	83	64	67	80	33	89	.335	.376	.529	29.181	29.110	29.125	29.139
20	60	79	57	65⅓	82	58	94	.426	.574	.436	29.125	29,082	29.095	29.101
21	55	80	71	68⅔	93	59	71	.404	.598	.537	29.145	29.077	29,015	29,079
22	66	86	72	74⅔	84	42	56	.536	.518	.505	29,087	29.042	28.987	29,039
23	64	81	70	71⅔	100	55	90	.596	.585	.658	29,020	29,017	29.057	29.031
24	70	84	79	77⅔	75	81	47	.550	.545	.510	28.947	28.869	28.869	28,895
25	70	85	67	74	85	64	84	.622	.420	.556	28,985	28.972	29.015	28.991
26	67	78	71	72	84	82	90	.556	.785	.682	29.065	29.047	28.950	29.021
27	72	83	65	73⅓	80	56	100	.631	.636	.617	28.927	28.947	29.020	28 965
28	60	68	60	62⅔	94	60	77	.487	.411	.396	29.148	29,181	29.206	29.178
29	62	78	75	71⅔	88	73	77	.491	.704	.666	29.154	29.080	28,987	29.074
30	73	69	67	69⅔	81	85	95	.655	.599	.626	28,975	29.082	29,133	29.063
------	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	69.69	85	56	79	.506	.525	.513	--------	--------	--------	29.077
Average	------------------				73			.515			--------------------------------			

THE MONTH OF SEPTEMBER, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning Rain or Snow.	Ending Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
70	St.	70	Cu. St.	100	St.	W	8	S W	8	----	0	81	67	------	------	------	----
100	Fog.	60	Cu. St.	90	Cu. St.	----	0	S W	1	----	0	80	59	------	------	------	----
00	--------	100	Cu. St.	00	--------	----	0	N W	3	----	0	81	62	------	------	------	----
100	Cu. St.	30	Cu. St.	00	--------	S	4	S W	16	S W	8	87	69	5 P. M.	6 P. M.	.04	----
20	Cir.	80	Cu. St.	00	--------	S	6	S W	16	----	0	96	74	------	------	------	----
30	Cu. St.	20	Cu.	00	--------	S W	4	S W	12	S W	5	97	75	------	------	------	----
00	--------	70	Cu.	Sm	oke.	S W	6	N	4	N E	1	90	58	------	------	------	----
Sm	oke.	70	Cu.	30	Cir. St.	E	1	S W	8	----	0	89	60	In	Night.	.01	----
100	St.	40	Cir. St.	00	--------	N E	1	W	1	----	0	77	55	------	------	------	----
100	St.	100	Cu. St.	100	Cu. St.	E	4	S W	12	S W	8	82	49	4 P. M.	8 P. M.	.27	----
00	--------	5	Cu.	00	--------	S W	4	W	12	----	0	71	43	------	------	------	----
60	Cu. St.	50	Cir.	00	--------	S W	8	S W	16	----	0	75	43	------	------	------	----
----	Fog.	00	--------	00	--------	W	1	S W	1	----	0	72	44	------	------	------	----
00	--------	00	--------	100	St.	S E	2	S E	2	----	0	78	52	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	E	1	S E	3	S E	3	68	61	6 A. M.	------	------	----
100	Cu. St.	100	Cu. St.	70	Cu. St.	S E	2	S W	6	----	0	63	52	------	6 A. M.	.71	----
50	Cu.	70	Cir. St.	50	St.	S E	3	S	4	----	0	71	50	------	------	------	----
00	--------	30	Cir.	00	--------	S E	1	S E	1	----	0	82	49	------	------	------	----
00	--------	00	--------	00	--------	----	0	S W	1	----	0	83	49	------	------	------	----
90	Cu. St.	20	Cu.	10	St.	----	0	N	1	S W	1	80	50	------	------	------	----
----	Fog.	30	Cir.	10	Cir.	----	0	S	5	S W	2	86	53	------	------	------	----
40	Cu. St.	30	Cir. St.	00	--------	E	4	S	2	N W	6	86	62	In	night.	.51	----
90	Cu. St.	100	Cu. St.	100	Cu. St.	----	0	S W	4	----	0	81	62	------	------	------	----
50	Cir. Cu.	10	Cu.	100	Nim.	S W	16	S W	24	S W	3	84	64	9 P. M.	10 P. M.	.15	----
80	Cu. St.	5	Cu.	30	St.	S W	8	S W	12	----	0	86	64	------	------	------	----
100	Nim.	100	Cu. St.	00	--------	S	6	S W	1	S	5	82	66	7 A. M.	10 A. M.	.23	----
100	Cu. St.	40	Cu.	100	Nim.	S W	8	W	5	----	0	83	60	6 P. M.	10 P. M.	.53	----
50	Cu. St.	10	Cu.	100	St.	----	0	S	1	----	0	68	58	------	------	------	----
100	St.	80	Cu.	00	--------	S E	5	S	12	S	12	78	62	------	------	------	----
60	Cir. St.	100	Nim.	100	Nim.	S	16	S W	8	S W	8	73	56	10 A. M.	12 M.	.46	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	2.91	----
59	--------	51	--------	41	--------	----	----	----	----	----	----	------	------	------	------	------	----
50																	

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	57	63	56	58⅔	100	78	100	.466	.447	.449	29.314	29.398	29.409	29.374
2	62	67	65	64⅔	100	100	100	.558	.622	.617	29.344	29.298	29.216	29.286
3	65	69	65	66⅓	94	85	94	.583	.599	.583	29.278	29.256	29.203	29.246
4	51	49	44	48	86	93	68	.321	.322	.195	29.246	29.254	29.378	29.293
5	34	56	34	41⅓	79	87	100	.155	.391	.196	29.557	29.522	29.507	29.529
6	37	52	47	45⅓	100	60	100	.220	.232	.323	29.467	29.377	29.332	29.392
7	51	71	66	62⅔	86	71	84	.321	.537	.536	29.252	29.125	29.141	29.173
8	65	72	56	64⅓	100	80	87	.617	.631	.391	29.098	29.112	29.218	29.143
9	46	67	54	55⅔	100	50	55	.311	.333	.231	29.252	29.248	29.309	29.270
10	37	53	38	42⅔	100	61	91	.220	.244	.207	29.477	29.517	29.524	29.506
11	41	63	58	54	82	42	53	.212	.243	.255	29.430	29.397	29.051	29.293
12	64	74	63	67	100	76	100	.596	.641	.576	28.965	29.017	29.112	29.031
13	55	59	43	52⅓	93	48	75	.404	.242	.208	29.296	29.437	29.465	29.399
14	43	48	50	47	75	85	100	.208	.284	.361	29.424	29.243	29.083	29.250
15	69	74	53	65⅓	95	76	73	.671	.641	.295	28.852	28.887	29.193	28.977
16	44	51	50	48⅓	100	100	100	.288	.374	.361	29.402	29.406	29.367	29.392
17	53	55	56	54⅔	100	93	100	.403	.404	.449	29.126	28.995	28.993	29.038
18	43	46	40	43	100	84	100	.278	.262	.248	29.151	29.244	29.322	29.239
19	34	56	46	45⅓	79	51	77	.155	.230	.238	29.357	29.244	29.186	29.262
20	41	44	35	40	91	76	100	.235	.218	.204	29.220	29.282	29.291	29.264
21	32	57	53	47⅓	100	58	73	.181	.268	.295	29.322	29.282	29.244	29.283
22	49	68	54	57	85	47	93	.297	.319	.389	29.257	29.224	29.204	29.228
23	51	58	49	52⅔	100	82	100	.374	.393	.348	29.162	29.105	29.023	29.097
24	45	49	45	46⅓	100	100	100	.299	.348	.299	28.883	28.795	28.813	28.830
25	45	61	47	51	92	50	85	.275	.269	.273	28.803	28.863	28.978	28.881
26	34	52	36	40⅔	90	73	90	.175	.282	.191	29.108	29.111	29.108	29.109
27	33	65	53	50⅓	89	44	93	.168	.272	.375	29.131	29.103	29.098	29.111
28	53	58	56	55⅔	93	83	100	.375	.422	.449	29.073	28.988	28.803	28.956
29	57	64	60	60⅓	94	39	77	.436	.229	.306	28.738	28.798	28.845	28.794
30	53	55	49	52⅓	73	74	85	.295	.321	.297	28.903	28.903	28.953	28.921
31	46	49	47	47⅓	92	79	85	.286	.271	.273	29.011	29.021	29.058	29.030
Sums	......	......	......	......	......	......	......	......	......	......	....	....	....	....
Means	......	......	......	52°.51	93	72	88	335	.334	.339	....	....	....	29.181
Average					84			.316			....			

THE MONTH OF OCTOBER, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOME'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Cu. St.	100	Cu. St.	100	Cu. St.	----	0	----	0	----	0	63	55	------	------	------	----
100	Cu. St.	100	Nim.	100	Nim.	S E	1	S E	2	----	0	68	62	9 A. M.	10 P. M.	.35	----
100	Cu. St.	90	Cu. St.	90	Cu. St.	----	0	S W	1	----	0	74	49	------	------	------	----
100	Cu. St.	90	Cu. St.	20	St.	N E	4	N	6	S W	4	58	32	------	------	------	----
00	--------	70	Cu. St.	30	Cir. Cu.	N	2	S W	3	----	0	56	32	------	------	------	----
80	Cir. Cu.	100	Cu. St.	100	Nim.	----	0	S	1	----	0	52	37	3 P. M.	10 P. M.	.25	----
80	Cu. St.	60	Cir. St.	20	Cir. Cu.	S E	4	S W	12	S W	1	72	50	------	------	------	----
100	Nim.	100	Cu. St.	00	--------	S	8	W	8	----	0	73	42	4 A. M.	11 A. M.	1.44	----
00	--------	40	Cu.	00	--------	----	0	N W	8	----	0	71	37	------	------	------	----
00	--------	15	Cu.	40	Cu. St.	----	0	N	1	----	0	54	35	------	------	------	----
70	St.	20	Cir.	100	Cu. St.	S E	5	S E	12	S E	16	64	38	10 P. M.	------	------	----
100	Nim.	100	Cu. St.	100	Cu. St.	S W	6	S W	8	S W	1	75	53	------	9 A. M.	.44	----
100	Nim.	20	Cu. St.	20	St.	N	10	N	5	N	7	59	36	1 A. M.	9 A. M.	.18	----
100	Cu. St.	100	Nim.	100	Nim.	E	9	E	2	S E	1	69	41	2 P. M.	------	------	----
80	Cu. St.	100	Cu. St.	10	St.	S W	12	W	16	W	4	75	42	------	5 A. M.	1.36	----
70	St.	100	Nim.	100	Nim.	----	0	E	1	E	1	53	42	9 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	E	1	N	1	----	0	70	41	------	------	------	----
100	Nim.	80	Cu. St.	00	--------	N	3	N W	2	----	0	50	30	------	9 A. M.	.43	----
20	St.	20	St.	00	--------	----	0	S	12	----	0	57	32	------	------	------	----
100	Cu. St.	100	Cu. St.	00	--------	N	3	N	1	----	0	50	30	------	------	------	----
80	St.	70	Cu. St.	20	St.	----	0	S	3	S W	3	58	32	------	------	------	----
50	Cir. St.	30	Cir. Cu.	20	St.	S W	4	S W	2	----	0	68	47	------	------	------	----
100	St.	100	St.	100	Nim.	----	0	E	2	E	1	58	43	7 P. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	N E	1	N E	8	E	3	48	40	------	8 P. M.	.35	----
00	--------	30	Cir. St.	00	--------	S W	6	W	8	----	0	61	32	------	------	------	----
80	St.	00	--------	00	--------	----	0	----	0	----	0	53	32	------	------	------	----
00	--------	30	Cu. St.	100	St.	----	0	S	3	----	0	67	33	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	S E	3	S	8	S E	12	58	52	7 A. M.	------	------	----
90	Cu. St.	60	Cu. St.	90	Cu. St.	S	6	S W	10	S W	8	64	48	------	5 A. M.	.38	----
100	Cu. St.	90	Cu. St.	90	Cu. St.	S W	6	W	6	S W	1	55	45	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	N W	1	W	1	W	2	49	43	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	---	----	------	------	------	------	5.56	----
74	--------	71	--------	56	--------	----	----	----	----	----	----	------	------	------	------	------	----
		67															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	46	60	52	52⅔	77	60	73	.238	.310	.282	29,056	29.007	29,015	29.026
2	40	49	46	48	85	78	100	.297	.271	.311	28.938	28.751	28.685	28,791
3	39	37	34	36⅔	82	90	90	.194	.199	.175	28.798	28.805	28.808	28,804
4	29	39	31	33	78	38	89	.124	,090	.155	28.816	28,885	28.903	28.868
5	38	39	39	38⅔	91	91	91	.207	.216	.216	28.660	28.788	29.078	28.842
6	38	58	46	47⅓	81	48	69	.186	.229	.215	29.214	29.188	29.192	29.198
7	48	51	52	50⅓	93	93	86	.310	.348	.334	29.135	29.056	29.011	29.067
8	54	59	47	53⅓	93	76	100	.389	.380	.323	28.986	29.013	29.103	29.034
9	38	47	38	41	81	41	63	.186	.134	.144	29.405	29.364	29.479	29.416
10	32	42	34	36	79	50	79	.144	.134	.155	29.627	29.644	29.634	29.635
11	32	39	38	36⅓	79	82	100	.144	.194	.229	29.575	29.417	29.041	29.344
12	46	44	37	42⅓	100	52	81	.311	.151	.178	28.640	28.557	28.736	28,644
13	36	41	38	38⅓	90	74	81	.191	.190	.186	28.856	28.888	28.973	28.906
14	32	42	28	34	79	50	66	.144	.134	.100	29.141	29.125	29.332	29.199
15	26	40	35	33⅔	88	56	70	.123	.139	.142	29.585	29.576	29,596	29.586
16	35	51	46	44	80	53	62	,162	.196	.202	29.510	29.397	29.248	29,385
17	52	53	57	54	54	86	87	.207	.348	.367	29.026	28.956	28.846	28.943
18	37	37	30	34⅔	81	81	100	.178	.178	.167	29.051	29.065	28.988	29.035
19	29	34	24	29	100	79	87	.160	.155	.112	29.041	29.041	29.350	29.144
20	16	26	25	22⅓	100	75	87	.090	.106	.117	29.530	29.448	29.370	29.449
21	29	35	32	32	78	70	100	.124	.142	.181	29.248	29.297	29.354	29,300
22	24	30	28	27⅓	100	78	100	.129	.130	.153	29.482	29.412	29.197	29.364
23	32	35	18	28⅓	79	70	84	.144	.142	.083	29,004	28,968	29.063	29.012
24	16	21	20	19	83	85	100	.074	.069	.108	29.051	29.105	29.206	29.121
25	14	23	25	20⅔	100	60	100	.082	.074	.135	29.187	29.167	29.029	29.128
26	32	36	32	33⅓	79	61	79	.144	.129	.144	29.031	29.043	29.134	29.069
27	35	41	33	36⅓	100	74	79	.204	.190	.151	28.989	29.102	29.333	29,141
28	28	58	40	42	100	64	73	.153	.309	.181	29.330	29.205	29.093	29.209
29	48	56	49	51	70	57	78	.236	.255	.271	29.054	29.013	29.013	29.027
30	49	54	48	50⅓	71	74	100	.260	.308	.235	28.918	28.936	28.853	28.902
31	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	38°.20	85	68	85	.184	.195	.192	--------	--------	--------	29.120
Average ----------------------						79			.190		------------------------			

THE MONTH OF NOVEMBER, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	10	St.	20	Cir. St.	S	6	S W	4	S W	2	64	43	------	------	------	----
80	Cu. St.	100	Nim.	100	Nim.	S	6	S	12	----	0	50	37	2 P. M.	12 P. M.	.38	----
100	Cu. St.	100	Nim.	100	St.	W	6	W	8	W	8	43	27	10 A. M.	10 P. M.	.10	1
100	St.	20	Cu.	50	St.	W	8	W	2	W	2	43	29	------	------	------	----
100	Cu. St.	100	Nim.	100	St.	S E	4	W	12	W	2	44	34	5 A. M.	5 P. M.	.10	----
10	St.	00	--------	10	St.	S	12	S	12	S E	8	61	37	------	------	------	----
90	St.	100	Nim.	100	Nim.	S	2	S E	8	S E	8	54	44	------	------	------	----
50	St.	100	Cu. St.	100	Nim.	S	8	S W	8	S W	1	59	38	4 P. M.	12 P. M.	.44	----
40	Cu. St.	5	Cu.	00	--------	W	8	W	20	S W	2	48	31	------	------	------	----
30	St.	70	Cir.	00	--------	W	1	N	6	----	0	45	30	------	------	------	----
100	St.	100	Nim.	100	Nim.	E	1	E	2	E	16	39	32	2 P. M.	------	------	----
100	Cu. St.	80	Cu. St.	100	Nim.	W	16	S W	10	W	12	46	34	------	4 A. M.	1.97	----
100	St.	100	Cu. St.	20	St.	S W	10	W	12	----	0	42	31	------	------	------	----
20	St.	40	Cir.	100	Cu. St.	S W	6	S W	8	S W	4	42	25	3 P. M.	5 P. M.	.04	----
100	St.	50	Cir.Cu.	100	St.	N W	8	S W	1	----	0	40	26	------	------	------	----
100	St.	30	Cir.Cu.	100	Cu. St.	S	8	S	12	S	8	52	34	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	S	12	S	8	S W	8	57	35	6 P. M.	12 P. M.	.15	----
100	St.	100	Cu. St.	100	Nim.	N	6	N E	6	N E	4	37	26	4 P. M.	------	------	----
100	Nim.	100	Cu. St.	100	Nim.	N W	2	W	8	W	16	34	12	------	10 P. M.	.35	4
00	--------	10	St.	00	--------	W	6	S W	8	S W	6	32	16	------	------	------	----
100	St.	100	St.	100	Cu. St.	S W	8	S W	8	W	4	35	22	------	------	------	----
100	St.	90	St.	00	--------	E	4	S E	8	S E	8	35	22	------	------	------	----
100	Cu. St.	40	Cu.	100	St.	S W	12	W	8	W	12	36	14	------	------	------	----
10	Cu.	100	Cu. St.	90	Cu. St.	W	12	W	16	W	12	24	13	------	------	------	----
90	St.	100	Cu. St.	100	Nim.	S W	20	W	24	N W	12	30	12	------	------	------	----
100	Cu. St.	100	Cu. St.	90	Cu. St.	N W	16	W	24	S W	8	36	12	------	------	------	----
100	St.	100	St.	100	Cu. St.	S W	16	W	12	W	8	41	28	------	------	------	----
10	St.	10	Cir.	00	--------	S E	8	S	20	S	15	62	28	------	------	------	----
80	Cir.Cu.	100	Cu. St.	100	Nim.	S W	15	S	18	S	11	58	46	6 P. M.	------	------	----
100	Cu. St.	100	St.	100	Nim.	S W	9	S W	8	W	9	58	32	------	12 P. M.	.56	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	4.09	5
77	--------	72	--------	73	--------	----	----	----	----	----	----	------	------	------	------	------	----
			74														

METEOROLOGICAL OBSERVATIONS FOR

DAY OF MONTH.	THERMOMETER, IN OPEN AIR.				RELATIVE HUMIDITY OR PER CENT OF SATURATION.			PRESSURE OF VAPOR IN INCHES.			BAROMETER, REDUCED TO FREEZING POINT.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7. A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	35	38	34	35⅔	90	63	70	.183	.144	.129	29.063	29.105	29.359	29.176
2	33	35	34	34	79	90	90	.170	.183	.175	29.407	29.354	29.322	29.361
3	31	36	34	33⅔	100	100	90	.174	.212	.175	29.337	29.332	29.332	29.334
4	32	38	33	34⅓	100	63	89	.181	.144	.168	29.332	29.299	29.317	29.316
5	33	33	33	33	89	89	79	.168	.168	.151	29.317	29.312	29.123	29.251
6	38	40	43	40⅓	63	73	83	.144	.181	.231	28.879	28.756	28.575	28.737
7	31	32	25	29⅓	69	69	87	.119	.126	.117	28.818	29.030	29.135	28.994
8	26	37	36	33	100	63	71	.141	.136	.149	29.016	28.885	28.943	28.948
9	26	32	22	26⅔	100	59	100	.141	.108	.118	29.149	29.282	29.409	29.280
10	14	31	26	23⅔	100	48	75	.082	.083	.106	29.505	29.482	29.477	29.488
11	28	31	31	30	100	100	100	.153	.174	.174	29.368	29.232	29.257	29.286
12	35	43	42	40	100	100	100	.204	.278	.267	28.978	28.976	29.048	29.001
13	46	56	43	48⅓	100	87	84	.311	.391	.254	28.785	28.771	28.915	28.824
14	33	31	25	29⅓	89	89	87	.168	.149	.117	29.189	29.224	29.384	29.266
15	24	30	26	26⅔	100	68	88	.129	.113	.123	29.507	29.498	29.514	29.506
16	32	43	37	37⅓	100	14	53	.181	.038	.116	29.338	29.217	29.245	29.267
17	35	48	42	41⅔	70	39	58	.142	.131	.155	29.218	29.159	29.217	29.198
18	30	46	31	35⅔	100	47	89	.167	.147	.155	29.422	29.425	29.437	29.428
19	36	47	38	40⅓	80	55	81	.170	.179	.186	29.362	29.320	29.332	29.338
20	39	45	40	41⅓	91	84	91	.216	.251	.225	29.334	29.369	29.398	29.367
21	36	39	40	38⅓	100	100	100	.212	.238	.248	29.307	29.166	29.045	29.173
22	37	39	36	37⅓	100	100	100	.220	.238	.212	28.946	28.743	28.848	28.846
23	30	33	26	29⅔	100	70	100	.167	.132	.141	29.108	29.189	29.304	29.200
24	24	39	32	31⅔	100	46	79	.129	.110	.144	29.345	29.281	29.264	29.297
25	30	43	38	37	89	51	81	.149	.142	.186	29.245	29.169	29.146	29.187
26	39	42	30	37	82	74	100	.194	.199	.167	29.098	29.131	29.125	29.118
27	31	39	37	35⅔	100	73	100	.174	.173	.220	29.018	28.925	28.843	28.929
28	40	46	42	42⅔	100	77	91	.248	.238	.244	28.786	28.743	28.776	28.768
29	35	41	30	35⅓	90	49	68	.183	.126	.113	28.831	28.725	28.781	28.779
30	22	23	24	23⅓	100	100	100	.118	.129	.129	28.696	28.635	28.688	28.673
31	20	23	21	21⅓	100	86	86	.108	.107	.096	28.688	28.898	28.846	28.811
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	34.°31	93.	72.	86.	.169	.167	.167	--------	--------	--------	29.134
Average						84			.168		------------------------------			

THE MONTH OF DECEMBER, 1881.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	30	Cir. St.	60	Cu. St.	W	21	N W	17	N W	14	38	30	------	------	------	----
100	St.	100	St.	100	St.	S	6	S E	3	S E	3	35	30	------	------	------	----
100	St.	100	St.	100	St.	E	3	E	3	E	4	36	30	------	------	------	----
100	St.	100	St.	10	Cu.	N E	2	S W	8	S W	9	38	30	------	------	------	----
100	St.	100	St.	100	St.	S W	11	S W	12	S	15	38	30	------	------	------	----
100	St.	100	St.	100	St.	S W	16	S W	12	S W	20	43	30	------	------	------	----
100	St.	80	Cir. Cu.	60	Cir. Cu.	W	20	N W	20	----	0	34	22	------	------	------	----
95	St.	30	Cir. St.	50	St.	S	12	S W	20	S W	16	38	24	------	------	------	----
20	St.	10	Cir.	5	St.	W	12	W	12	W	8	35	12	------	------	------	----
10	St.	5	Cir.	----	--------	S W	1	N W	8	W	6	35	13	------	------	------	----
100	St.	100	Nim.	100	St.	S	8	S E	8	S	6	35	27	12 M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S	12	S W	16	S W	2	46	33	6 A. M.	------	------	----
100	Nim.	100	Cu. St.	100	Nim.	S	5	S W	16	S W	12	56	31	------	11 P. M.	.100	----
100	Cu. St.	20	Cu.	00	--------	W	8	N W	12	S W	4	35	22	------	------	------	----
00	--------	10	Cir.	00	--------	N W	7	N W	5	N W	9	38	23	------	------	------	----
80	Cir. St.	30	Cir. St.	20	St.	S W	16	S W	24	S W	20	43	23	------	------	------	----
70	Cir. St.	20	St.	20	St.	S W	16	S W	20	S W	12	48	28	------	------	------	----
00	--------	10	Cir.	00	--------	----	0	S W	8	----	0	46	27	------	------	------	----
90	St.	100	Cir. St.	90	Cir. St.	S W	8	W	8	----	0	47	34	------	------	------	----
100	St.	100	Cu. St.	100	Cu. St.	----	0	N E	4	N E	8	45	34	6 A. M.	------	------	----
100	St.	100	Nim.	100	Nim.	N E	6	E	8	E	1	40	36	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N	4	N E	8	N E	24	39	26	------	11 P. M.	.40	----
50	Cu. St.	30	Cir. St.	00	--------	N E	16	N	12	N	1	36	22	------	------	------	----
00	--------	00	--------	00	--------	----	0	S	12	S	8	40	22	------	------	------	----
10	St.	80	Cir. St.	90	St.	S	12	S W	8	S	10	43	29	------	------	------	----
100	St.	100	St.	00	--------	S W	6	W	8	----	0	43	26	------	------	------	----
20	St.	100	St.	100	Nim.	N E	3	N E	3	----	0	40	30	4 P. M.	12 M.	.30	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	S	12	S W	20	----	0	46	32	------	------	------	----
10	St.	30	Cu.	30	Cir. Cu.	W	3	W	16	S W	1	41	21	------	------	------	----
100	St.	100	Nim.	100	Cu. St.	W	8	S W	20	W	12	26	19	2 P. M.	7 P. M.	.05	1
100	Cu. St.	100	St.	60	Cu.	W	12	W	12	N	8	24	14	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
73	--------	69	--------	58	--------	----	----	----	----	----	----	------	------	------	------	1.75	1
			67														

ABSTRACT OF METEOROLOGICAL TABLES FOR 1881.

MONTHS.	Barometer Corrected for Temperature of 32° F.	Mean Temperature in Open Air.	Relative Humidity.	Pressure of Vapor in Inches of Mercury.	Percentage of Cloudiness.	Rain and Melted Snow in Inches.	Snow in Inches.
January	29.077	16°.98	81	.081	65	2.29	30.40
February	29.152	21°.58	93	.127	68	3.77	19.00
March	28.889	20°.28	86	.145	67	2.66	17.00
April	29.064	45°.59	71	.199	49	1.73	5.25
May	29.166	65°.24	71	.446	37	2.11	
June	29.018	64°.31	78	.472	58	4.37	
July	29.093	73°.14	73	.590	38	1.81	
August	29.107	72°.69	70	.538	40	1.63	
September	29.077	69°.69	73	.513	50	2.91	
October	29.181	52°.51	84	.345	67	5.56	
November	29.120	38°.20	79	.191	74	4.09	5.00
December	29.164	34.°31	84	.168	67	1.75	1.00
Mean for the year	29.086	47°.88	79	.318	57		
Sums						34.66	77.65

Thunder showers during the year, 22.

REGISTER

OF

METEOROLOGICAL OBSERVATIONS,

FOR THE YEAR 1882,

TAKEN AT THE

State Agricultural College of Michigan,

BY R. C. KEDZIE,

PROF. OF CHEMISTRY.

LATITUDE 42° 43′ 56″; LONGITUDE 7° 25′ 59″ WEST OF WASHINGTON.
Height above the Sea, 834 feet.

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	15	18	9	14	100	84	100	.086	.083	.065	29.061	29.192	29.156	29.136
2	5	23	24	17⅓	100	73	74	.055	.090	.095	29.131	29.111	29.138	29.127
3	23	24	12	19⅔	100	61	100	.123	.079	.075	29.174	29.258	29.462	29.298
4	3	20	13	12	100	85	100	.050	.092	.078	29.623	29 584	29.542	29.583
5	15	22	22	19⅔	100	86	100	.086	.101	.118	29.498	29.442	29.390	29.443
6	25	30	33	29⅓	100	100	89	.135	.167	.168	29.009	28.943	29.058	29.003
7	34	36	35	35	79	80	100	.155	.170	.204	29.143	29.103	28.963	29.070
8	47	44	36	42⅓	100	100	80	.323	.288	.170	28.733	28.763	28.917	28.804
9	27	31	29	29	100	79	78	.147	.137	.124	29.109	29.236	29.348	29.231
10	28	35	30	31	100	70	100	.153	.142	.167	29.355	29.224	29.012	29.197
11	30	35	32	32⅓	100	70	79	.167	.142	.138	29.063	29.158	29.390	29.204
12	14	31	28	24⅓	100	89	100	.082	.155	.229	29.443	29.368	29.231	29.347
13	32	36	34	34	100	90	79	.181	.191	.155	28.844	28.728	28.778	28.783
14	18	20	19	19	100	85	69	.098	.092	.071	28.964	29.026	28.950	28.980
15	32	38	35	35	89	45	70	.162	.103	.142	28.884	28.957	28.978	28.940
16	25	23	14	20⅔	87	73	100	.117	.090	.082	29.011	29.100	29.196	29.102
17	11	12	10	11	100	62	100	.071	.049	.068	29.338	29.230	29.230	29.266
18	9	22	23	18	100	100	100	.065	.118	.129	29.091	29.096	29.131	29.106
19	20	29	24	24⅓	100	89	100	.108	.142	.129	29.089	29.196	29.297	29.194
20	26	36	33	31⅔	88	61	89	.123	.129	.168	29.142	29.028	29.042	29.071
21	34	36	33	34⅓	100	100	89	.196	.212	.168	28.909	28.856	28.948	28.904
22	13	16	10	13	100	83	100	.078	.074	.068	29.365	29.416	29.517	29.433
23	5	11	3	6⅓	100	80	100	.055	.057	.050	29.621	29.660	29.735	29.672
24	-1	17	16	10⅔	100	83	100	.041	.078	.090	29.704	29.590	29.360	29.551
25	26	35	38	33	100	100	100	.141	.204	.229	29.134	28.958	28.829	28.974
26	41	45	45	43⅔	100	92	77	.251	.275	.238	28.853	28.604	28.522	28.660
27	27	39	32	32⅔	77	64	79	.117	.152	.144	29.233	29.103	29.058	29.131
28	33	35	19	29	89	80	69	.168	.170	.071	28.834	28.921	29.143	28.966
29	12	20	15	15⅔	100	70	100	.075	.076	.086	29.468	29.448	29.373	29.430
30	5	32	26	21⅓	100	59	88	.086	.108	.118	29.265	29.083	28.998	29.115
31	22	35	31	29⅓	100	61	79	.118	.128	.137	28.759	28.693	28.796	28.749
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	24°.89	97	79	90	.123	.132	.128	--------	--------	--------	29.144
Average	-------------------				89			.128			----------------------------------			

THE MONTH OF JANUARY, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOME'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
20	St.	30	Cu.	00	--------	N	2	N E	3	----	0	22	4	------	------	------	----
10	St.	90	Cir. Cu.	100	Cu. St.	----	0	S W	8	S W	12	25	4	Flur	ry of	Snow	----
100	St.	70	Cu.	80	Cu.	W	8	N W	12	N E	1	26	0	------	------	------	----
70	St.	100	St.	100	St.	N E	1	E	12	N E	4	21	3	------	------	------	----
100	St.	100	St.	100	St.	N E	3	N E	2	----	0	25	15	------	------	------	----
100	St.	100	Nim.	100	Nim.	S E	6	S W	20	S W	16	36	24	9 A.M.	10P.M.	.10	½
100	St.	100	Cu. St.	100	Nim.	----	0	S E	8	S E	12	47	32	3 P. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S	12	S W	20	W	20	50	26	------	4 P. M.	.18	----
100	Cu. St.	100	Cu. St.	00	--------	W	16	W	12	----	0	33	23	------	------	------	----
100	St.	100	Cu. St.	100	Nim.	----	0	S E	5	S	3	35	27	3 P. M.	10P.M.	.30	4
100	St.	100	Cu. St.	10	Cir. St.	W	8	W	20	----	0	35	14	------	------	------	----
100	St.	100	St.	100	St.	----	0	----	0	S W	4	32	14	------	------	------	----
100	Nim.	100	Nim.	100	St.	S	3	S W	12	W	28	36	17	7 A.M.	------	------	----
100	Nim.	50	Cu.	00	--------	W	20	S W	16	S W	16	32	14	------	8 A. M.	.18	½
100	St.	100	Cu. St.	100	St.	S W	12	S W	8	W	1	38	24	------	------	------	----
100	St.	30	Cir. St.	00	--------	N W	12	N W	12	NW	12	25	9	------	------	------	----
90	St.	50	Cu. St.	100	St.	----	0	W	12	W	5	13	5	------	------	------	----
100	St.	100	St.	100	St.	W	16	S W	16	S W	6	25	6	------	------	------	----
100	St.	40	Cu. St.	00	--------	S E	6	S	1	N	8	34	19	------	------	------	----
70	Cir. St.	100	St.	100	Cu. St.	S W	8	S W	12	----	0	36	26	------	------	------	----
100	Nim.	100	Nim.	100	St.	S W	6	W	8	W	20	36	12	5 A.M.	3 P. M.	.18	1½
80	Cu. St.	80	Cu. St.	20	St.	N W	20	W	24	W	12	15	4	------	------	------	----
100	Cu. St.	40	Cu.	20	St.	----	0	N W	12	E	4	12	-2	------	------	------	----
10	St.	70	Cir. St.	20	St.	E	6	S E	12	S E	12	26	-1	------	------	------	----
100	St.	100	Nim.	100	Nim.	S	12	S	12	S W	16	42	26	10A.M.	------	------	----
100	Fog.	100	Nim.	100	Nim.	----	0	S	12	S W	28	39	26	------	10P.M.	.53	----
00	--------	00	--------	10	St.	W	8	S E	4	S E	8	30	21	------	------	------	----
100	St.	100	Cu. St.	20	Cu.	S W	8	W	24	W	20	35	10	------	------	------	----
70	Cu. St.	40	Cu.	00	--------	N W	16	W	20	W	16	23	12	------	------	------	----
00	--------	5	Cu.	10	Cir.	S W	12	S W	20	S	6	35	15	------	------	------	----
100	St.	30	Cir. St.	100	St.	----	0	S W	1	W	8	40	22	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	---	----	------	------	------	------	1.47	6½
81	--------	75	--------	61	--------	----	----	----	----	----	----	------	------	------	------	------	----

72

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, In Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	30	37	32	33	78	81	79	.130	.178	.144	28.859	28.808	28.926	28.864
2	22	42	35	33	100	27	70	.118	.071	.142	29.009	28.782	28.883	28.891
3	21	35	32	29⅓	71	45	79	.080	.091	.144	29.180	29.098	28.918	29.065
4	29	40	26	31⅔	89	39	75	.142	.097	.106	28.718	28.640	28.728	28.695
5	23	36	31	30	86	61	69	.107	.129	.119	28.724	28.736	28.959	28.806
6	25	47	37	36⅓	87	41	71	.117	.134	.157	29.151	29.017	28.938	29.035
7	47	48	36	43⅔	62	78	80	.202	.260	.170	28.821	28 765	28.961	28.849
8	25	42	34	33⅔	75	27	52	.100	.071	.103	29.164	29.055	28.998	29.072
9	22	46	39	35⅔	86	40	46	.101	.125	.110	28.858	28.790	28.843	28.830
10	30	42	35	35⅔	78	66	90	.130	.177	.183	29.143	29.263	29.314	29.250
11	34	53	49	45⅓	61	36	57	.121	.146	.199	29.274	29.178	29.130	29.194
12	48	54	55	52⅓	78	80	81	.260	.335	.349	29.061	28.968	28.881	28.970
13	40	46	34	40	82	26	61	.212	.082	.121	28.838	28.957	29.123	28.973
14	30	47	39	38⅔	78	34	55	.130	.112	.131	29.151	29.105	29.068	29.108
15	35	57	45	45⅔	70	36	61	.142	.166	.182	29.073	28.972	29.025	29.023
16	43	51	39	44⅓	83	86	82	.231	.308	.194	28.931	28.845	29.102	28.959
17	26	22	20	22⅔	100	86	85	.141	.101	.092	29.517	29.640	29.663	29 607
18	23	39	33	31⅔	100	55	89	.123	.131	.168	29.600	29.424	29.304	29.443
19	40	43	34	39	100	75	79	.248	.208	.155	29.073	29.203	29.156	29.144
20	28	32	27	29	100	79	100	.153	.144	.147	29.156	29.013	28.800	28.990
21	33	25	23	27	89	100	100	.168	.135	.123	28.293	28.365	28.700	28.453
22	20	23	18	20⅓	100	100	100	.108	.123	.098	28.894	28.963	29.070	28.976
23	17	29	25	23⅔	100	78	100	.094	.124	.135	29.213	29.267	29.370	29.283
24	19	32	22	24⅓	100	69	100	.103	.126	.118	29.515	29.557	29.528	29.533
25	16	38	32	28⅔	100	45	89	.090	.103	.162	29.505	29.426	29.391	29.441
26	34	41	38	37⅔	90	82	91	.175	.212	.207	29.252	29.318	29.253	29.274
27	37	48	43	42⅔	90	56	59	.199	.189	.164	29.242	29.104	29.080	29.142
28	44	48	53	48⅓	84	100	93	.241	.335	.375	28.788	28.594	28.471	28.618
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Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	35°.12	86	62	78	.149	.158	.161	--------	--------	--------	29.05
Average	-------------------				75			.156			------------------------------			

THE MONTH OF FEBRUARY, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Cu. St.	90	Cu. St.	00	--------	W	12	S W	24	W	12	38	22	------	------	------	----
00	--------	90	Cir.Cu.	00	--------	S W	8	S W	20	W	12	42	19	------	------	------	----
0	--------	80	Cu.	00	--------	N W	1	S E	8	S E	12	38	20	------	------	------	----
10	Cir. St.	5	Cu.	00	--------	S W	3	W	16	N W	4	40	21	------	------	------	----
0	--------	100	Cu.	75	Cir. Cu.	S	1	W	12	W	3	37	21	------	------	------	----
25	Cir. Cu.	90	Cir. St.	00	--------	S	3	S E	12	S E	8	48	23	------	------	------	----
90	Cu.	100	Cu. St.	100	Cu.	S E	16	S W	12	W	8	50	23	------	------	------	----
0	--------	0	--------	00	--------	N E	1	S	8	S W	8	44	21	------	------	------	----
20	Cir.	0	--------	00	--------	S E	1	W	8	S W	1	47	21	------	------	------	----
0	--------	0	--------	00	--------	N W	8	N W	8	N W	1	44	29	------	------	------	----
0	--------	100	Cu. St.	100	Nim.	S E	2	S	12	S	S	53	33	------	------	------	----
100	Nim.	100	Cu. St.	100	Cu. St.	S	8	S W	24	S W	24	56	40	------	------	------	----
100	Cu. St.	0	--------	00	--------	W	16	W	24	S W	6	53	12	------	------	------	----
0	--------	0	--------	10	Cu. St.	S W	2	S W	16	S W	8	45	27	------	------	------	----
20	Cir. Cu.	0	--------	00	--------	S W	8	S W	12	S	6	49	28	------	------	------	----
25	Cir.	100	Nim.	100	St.	S E	6	S W	6	N E	12	57	32	10 A. M.	------	------	----
100	St.	100	Nim.	10	St.	N	12	N E	12	N E	12	28	16	------	3 P. M.	.05	----
100	Cu. St.	50	Cir.Cu.	100	St.	E	S	S E	16	S E	16	43	23	------	------	------	----
100	Nim.	100	Cu. St.	100	St.	S W	8	W	12	----	0	46	28	------	------	------	----
100	St.	100	St.	100	Nim.	N E	8	E	8	E	12	32	26	1 P. M.	------	------	----
100	Nim.	100	Nim.	100	Nim.	S W	16	S W	20	W	16	33	18	------	------	------	----
100	Nim.	100	Nim.	20	St.	W	12	W	12	W	12	26	15	------	3 P. M.	.84	5
100	St.	100	St.	100	St.	S W	8	W	12	W	8	30	15	------	------	------	----
30	Cir. St.	20	Cu.	00	--------	----	0	W	4	----	0	37	14	------	------	------	----
----	--------	60	Cir. St.	20	St.	----	0	S W	12	S	12	41	16	------	------	------	----
100	St.	100	St.	100	Fog.	S	8	S W	6	----	0	41	32	------	------	------	----
100	St.	100	St.	100	St.	----	0	S E	12	S E	12	52	37	------	------	------	----
100	St.	100	Nim.	100	Cu. St.	S E	10	S E	12	S E	16	53	43	9 A. M.	12 M.	1.39	----
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54	--------	67	--------	48	--------	----	----	----	----	----	----	------	------	------	------	------	----
		56															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	43	58	48	49⅔	92	37	70	.354	.178	.236	28.712	28.835	28.900	28.816
2	40	66	54	53⅓	91	41	38	.225	.259	.157	29.021	29.033	29.135	29.063
3	34	50	41	41⅔	90	26	41	.175	.094	.105	29.322	29.296	29.304	29.307
4	30	40	38	36	89	56	63	.149	.139	.144	29.329	29.246	29.113	29.229
5	40	58	43	47	91	42	59	.225	.203	.164	28.838	28.852	28.930	28.890
6	35	35	31	33⅔	80	70	69	.162	.142	.119	29.013	29.073	29.284	29.123
7	24	27	22	24⅓	34	76	100	.112	.112	.118	29.475	29.641	29.705	29.607
8	21	34	32	29	100	70	89	.113	.139	.162	29.687	29.497	29.343	29.509
9	32	32	33	32⅓	100	100	100	.181	.181	.188	28.993	28.780	28.604	28.792
10	30	35	32	32⅓	100	70	100	.167	.142	.181	29.088	29.273	29.371	29.244
11	30	32	31	31	100	100	100	.167	.181	.174	29.378	29.156	29.103	29.212
12	31	34	30	31⅔	100	79	89	.174	.155	.149	28.891	28.885	28.898	28.891
13	23	32	28	27⅔	100	59	77	.123	.108	.117	28.976	29.091	29.166	29.078
14	22	37	32	30⅓	73	53	100	.101	.116	.181	29.243	29.268	29.230	29.247
15	30	35	32	32⅓	100	90	100	.167	.183	.181	29.071	29.008	29.158	29.079
16	27	38	31	32	83	63	89	.129	.144	.155	29.307	29.341	29.376	29.341
17	29	37	34	33⅓	100	63	79	.160	.136	.155	29 362	29.231	29.080	29.224
18	37	49	39	41⅔	100	93	73	.220	.322	.173	28.829	28.708	28.948	28.828
19	37	53	41	43⅔	81	31	74	.178	.123	.190	29.222	29.229	29.211	29.221
20	40	45	37	40⅔	73	53	81	.181	.160	.178	29.169	28.991	28.845	29.002
21	32	26	28	28⅔	100	88	88	.181	.123	.136	28.590	28.676	28.771	28.679
22	22	28	27	25⅔	100	100	100	.118	.153	.147	29.044	29.282	29.439	29.255
23	30	50	40	40	100	52	39	.167	.186	.097	29.318	29.026	29.065	29.136
24	19	33	24	25⅓	85	70	100	.087	.132	.129	29.367	29.387	29.389	29.381
25	21	29	33	27⅔	100	100	100	.113	.160	.181	29.377	29.128	29.025	29.177
26	42	52	51	48⅓	83	73	79	.221	.282	.296	28.891	28.826	28.668	28.795
27	54	41	34	43	87	65	79	.362	.168	.155	28.320	28.617	28.858	28.598
28	25	43	37	35	87	43	90	.117	.121	.199	29.068	29.128	28.998	29.065
29	40	57	49	48⅔	82	41	48	.203	.191	.131	28.799	28.785	28.880	28.821
30	33	44	32	36⅓	79	30	59	.151	.087	.108	29.294	29.404	29.441	29.380
31	24	39	34	32⅓	74	55	79	.095	.131	.155	29.587	29.461	29.211	29.420
Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	35°.96	89	64	79	.170	.160	.160	--------	--------	--------	29.110
Average -------------------					77			.163			------------------------------			

THE MONTH OF MARCH, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning Rain or Snow.	Ending Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
90	Cu. St.	00	--------	50	Cir.	N W	8	S	8	S	8	64	38	------	------	------	----
40	Cir. St.	20	St.	20	Cir. Cu.	----	0	S W	8	----	0	66	33	------	------	------	----
00	--------	20	Cir.	00	--------	----	0	N W	12	----	0	56	28	------	------	------	----
100	St.	100	St.	70	Cu. St.	E	4	E	6	E	12	40	29	In	night.	.41	----
80	Cu. St.	10	Cir. St.	100	St.	S	8	S W	12	S W	8	60	33	------	------	------	----
100	St.	100	Cu. St.	100	St.	W	6	W	24	S W	12	37	23	------	------	------	----
100	Cu. St.	100	Cu. St.	100	St.	N W	8	N W	8	N W	2	28	16	------	------	------	----
60	Cir. Cu.	90	Cu. St.	100	St.	E	4	S E	2	S E	5	36	20	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N E	5	S E	8	N E	8	34	28	5 A. M.	------	------	----
90	Cu. St.	100	Cu. St.	100	Cu. St.	N W	8	N W	8	----	0	35	26	------	6 A. M.	1.02	¼
100	Cu. St.	100	Cu. St.	100	Nim.	N W	12	S W	16	S W	8	33	28	------	------	------	----
100	Nim.	90	Cu. St.	100	Cu. St.	----	0	W	12	W	2	38	21	5 A. M.	8 A. M.	.15	1½
00	--------	80	Cu. St.	00	--------	W	8	N W	8	W	12	34	19	------	------	------	----
10	St.	40	Cu.	100	Cu. St.	----	0	N E	8	N E	8	44	22	4 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	N E	6	E	2	E	8	37	26	------	7 P. M.	.30	3
100	St.	30	Cu.	00	--------	N	12	E	8	E	8	43	27	------	------	------	----
30	St.	100	St.	100	Cu. St.	S E	8	S E	2	S E	2	37	27	------	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S E	4	S	16	S W	8	53	31	3 A. M.	5 P. M.	.40	----
30	Cir. St.	60	Cir. St.	00	--------	W	12	W	8	W	12	55	35	------	------	------	----
100	St.	100	St.	100	Nim.	----	0	E	8	E	1	46	30	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	S W	4	S W	12	S W	16	32	21	5 A. M.	10 P. M.	.25	¼
100	St.	100	St.	00	--------	N	16	N W	20	----	0	30	22	------	------	------	----
100	Cu. St.	00	--------	30	St.	S W	16	S W	8	N	16	52	17	------	------	------	----
50	Cu. St.	30	Cu.	00	--------	N W	12	N W	16	W	12	33	18	------	------	------	----
100	St.	100	Nim.	100	Cu. St.	S E	8	S E	16	S E	16	42	21	11 A. M.	6 P. M.	.40	4
100	Nim.	100	Nim.	100	Nim.	----	0	S	8	S E	12	54	42	6 A. M.	10 P. M.	.65	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	S W	24	S W	20	W	8	54	22	------	------	------	----
00	--------	00	--------	90	Cir. Cu.	N	8	W	8	----	0	46	24	------	------	------	----
100	Cir. St.	100	Nim.	00	--------	S W	20	S W	20	S	16	59	31	------	------	------	----
30	Cu. St.	10	Cir.	00	--------	N W	16	N W	20	----	0	46	22	------	------	------	----
10	St.	100	Cu. St.	00	--------	N E	8	E	6	S E	12	43	24	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	3.58	6
72	--------	70	--------	63	--------	----	----	----	----	----	----	------	------	------	------	------	----
		68															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	43	67	60	56⅔	75	50	71	.208	.333	.367	29.071	29.028	28.990	29.030
2	58	72	51	60⅓	76	30	72	.365	.237	.270	29.063	29.145	29.303	29.170
3	38	71	54	54⅓	91	49	55	.207	.398	.231	29.369	29.183	29.128	29.227
4	62	69	38	56⅓	67	100	100	.369	.708	.229	29,015	29.082	29.244	29.114
5	34	39	40	37⅔	90	91	82	.175	.216	.203	29.262	29.303	29.256	29.274
6	41	64	63	56	91	68	83	.235	.403	.478	29.088	28.910	28.872	28.957
7	48	54	48	50	78	66	85	.260	.257	.284	29.095	29.259	29.228	29.194
8	41	61	45	49	91	77	92	.235	.412	.275	29.260	29,191	29.175	29.209
9	35	38	30	34⅓	100	72	57	.204	.165	.095	29.068	29,021	29.048	29.046
10	24	25	23	24	87	75	100	.112	.100	.123	29.066	29.123	29.178	29.122
11	24	27	25	25⅓	100	100	100	.129	.147	.135	29.172	29.138	29.196	29.169
12	31	38	36	35	100	63	71	.174	.144	.089	29.145	29.148	29.115	29.136
13	35	42	38	38⅓	70	50	81	.142	.134	.186	29.138	29.117	29.138	29.131
14	34	42	38	38	79	42	91	.155	.113	.207	29.159	29.168	29.195	29.181
15	33	51	36	40	79	40	90	.151	.149	.191	29.214	29.186	29.221	29.207
16	38	60	44	47⅓	54	24	37	.133	.100	.108	29.261	29.225	29.258	29.248
17	43	64	48	51⅔	51	25	36	.142	.150	.121	29.303	29.235	29.235	29.258
18	43	59	56	52⅔	67	54	51	.186	.269	.230	29.196	29,030	28.837	29.021
19	56	60	45	53⅔	81	82	92	.363	.426	.275	28.424	28.299	28.384	28.369
20	37	39	39	38⅓	90	73	73	.199	.173	.173	28.612	28.675	28.853	28.713
21	34	57	46	45⅔	79	31	54	.155	.142	.169	29.013	29.058	29.077	29.049
22	38	47	40	41⅔	72	34	56	.165	.112	.139	29.143	29.067	29.032	29.081
23	36	51	34	40⅓	63	34	70	.129	.126	.139	29.026	29.070	29.178	29,091
24	37	55	40	44	53	33	56	.116	.144	.139	29.298	29.251	29.305	29,285
25	33	58	42	44⅓	79	37	42	.151	.178	.113	29.304	29.208	29.216	29.243
26	38	52	40	43⅓	54	23	56	.123	.091	.139	29.116	29.037	29.072	29.075
27	40	58	50	49⅓	65	37	65	.160	.178	.234	29.072	29.005	29,042	29.040
28	47	49	45	47	62	64	76	.202	.223	.228	29.025	29.073	29.161	29.086
29	40	54	42	45⅓	73	38	66	.181	.157	.177	29.191	29.158	29.148	29.166
30	40	45	38	41	82	65	54	.203	.182	.123	29.151	29.151	29.140	29.147
------	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	44°.70	77	54	70	.191	.219	.196	--------	--------	--------	29.101
Average	------------------				67			.202			----------------------------------			

THE MONTH OF APRIL, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
40	St.	20	St.	00	--------	S W	12	S W	16	S	16	71	43	In	night.	.06	----
5	St.	00	--------	00	--------	W	12	N	8	----	0	73	35	------	------	------	----
00	--------	30	St.	100	Cir. St.	E	8	S E	12	S E	12	71	38	------	------	------	----
90	Cu. St.	100	Nim.	100	Cu. St.	S W	12	N E	12	N E	12	69	32	9 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	N E	12	E	12	S E	8	41	35	------	5 P. M.	1.22	----
100	St.	100	Cu. St.	00	--------	S E	8	S W	12	S W	8	68	42	------	------	------	----
100	Cu. St.	80	Cu. St.	00	--------	S W	12	W	12	----	0	58	38	------	------	------	----
100	St.	70	Cu. St.	80	St.	E	16	E	6	S E	3	61	38	------	------	------	----
100	St.	100	Cu. St.	100	Cu. St.	N E	8	N E	12	N E	8	39	25	------	------	------	----
100	St.	100	Cu. St.	100	Cu. St.	N E	12	N E	12	N E	12	25	21	7 A. M.	10 A. M.	------	----
100	Cu.	100	Cu. St.	50	Cu.	W	12	N	12	N	6	31	25	------	------	------	----
80	Cu.	100	Cu. St.	5	St.	N	8	NW	8	W	6	42	31	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	W	8	NW	12	----	0	42	34	------	------	------	----
100	St.	100	St.	100	St.	W	5	W	8	S W	8	42	29	------	------	------	----
00	--------	20	Cu.	00	--------	----	0	NW	3	----	0	52	30	------	------	------	----
30	Cu.	40	Cu.	00	--------	W	6	W	2	----	0	62	35	------	------	------	----
00	--------	10	Cu.	00	--------	S W	2	W	8	----	0	64	39	------	------	------	----
10	Cir. St.	100	Cir. St.	00	--------	----	0	S	12	----	0	67	43	------	------	------	----
70	Cir. St.	100	Nim.	100	Nim.	S	8	S	12	W	24	60	36	4 A. M.	------	------	----
100	Nim.	100	Nim.	50	St.	NW	16	W	20	NW	8	40	32	------	7 P. M.	.45	----
00	--------	40	Cu.	00	--------	N	8	NW	4	----	0	58	35	------	------	------	----
100	St.	100	St.	50	St.	E	8	E	12	E	16	50	34	------	------	------	----
100	St.	20	St.	00	--------	N E	12	N E	16	----	0	53	30	------	------	------	----
20	Cir. St.	30	Cir. St.	10	St.	E	6	N E	8	N E	4	60	28	------	------	------	----
70	St.	50	Cu. St.	00	--------	E	4	N E	6	S E	8	60	33	------	------	------	----
100	St.	100	St.	00	--------	N E	6	N E	8	N E	8	55	35	------	------	------	----
00	--------	60	Cu.	00	--------	----	0	S W	8	S W	8	61	41	In	night.	.15	----
00	--------	100	Cu. St.	10	Cir.	NW	12	W	12	N	4	50	34	------	------	------	----
20	St.	60	Cu. St.	10	Cir.	----	0	W	8	----	0	54	36	------	------	------	----
100	Cu. St.	100	Cu. St.	00	--------	N E	8	W	12	----	0	51	35	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	1.88	----
61	--------	71	--------	39	--------	----	----	----	----	----	----	------	------	------	------	------	----
			57														

METEOROLOGICAL OBSERVATIONS FOR

DAY OF MONTH.	THERMOMETER, IN OPEN AIR.				RELATIVE HUMIDITY, OR PER CENT OF SATURATION.			PRESSURE OF VAPOR IN INCHES.			BAROMETER, REDUCED TO FREEZING POINT.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	44	54	43	47	52	26	43	.151	.110	.121	29.043	28.982	29.093	29.039
2	32	49	40	40⅓	59	31	39	.108	.108	.097	29.377	29.348	29.328	29.351
3	37	65	57	53	63	40	94	.136	.244	.436	29.277	29.098	29.068	29.148
4	54	59	51	54⅔	93	82	72	.389	.409	.272	28.931	28.912	28.918	28.920
5	42	57	36	45	50	36	71	.134	.166	.149	28.963	29.003	29.078	29.015
6	40	59	41	46⅔	56	38	82	.139	.190	.212	29.138	29.181	29.241	29.187
7	50	67	52	56⅓	58	42	66	.078	.274	.270	29.292	29.238	29.263	29.264
8	52	61	60	57⅔	86	94	88	.334	.505	.456	29.128	29.050	29.032	29.070
9	59	76	54	63	94	60	100	.469	.542	.418	29.042	28.940	28.942	28.975
10	58	57	45	53⅓	100	94	100	.482	.439	.299	28.830	28.672	28.740	28.747
11	43	45	44	44	92	92	84	.254	.275	.241	28.791	28.852	28.878	28.840
12	42	45	40	42⅓	91	92	91	.244	.275	.225	28.826	28.870	28.905	28.867
13	42	45	45	44	91	84	84	.244	.251	.251	28.898	28.913	28.926	28.912
14	48	60	45	51	70	65	46	.236	.338	.138	28.923	28.926	28.965	28.938
15	40	50	41	43⅔	73	58	49	.181	.209	.126	29.053	29.116	29.174	29.114
16	38	62	53	51	81	36	48	.165	.255	.194	29.306	29.284	29.274	29.288
17	50	73	54	59	45	28	55	.162	.223	.231	29.309	29.328	29.331	29.323
18	53	73	57	61	61	28	47	.244	.223	.217	29.441	29.391	29.336	29.389
19	52	69	57	59⅓	66	48	58	.257	.336	.268	29.304	29.231	29.198	29.244
20	56	78	62	65⅓	63	46	51	.282	.443	.284	29.151	29.042	28.992	29.062
21	55	68	50	57⅔	68	42	65	.295	.290	.234	28.988	28.988	29.080	29.019
22	44	50	43	45⅔	68	52	75	.195	.186	.208	29.143	29.138	29.166	29.149
23	42	51	44	45⅔	66	46	60	.177	.173	.173	29.143	29.242	29.296	29.227
24	41	59	50	50	65	65	65	.168	.323	.234	29.327	29.279	29.216	29.274
25	47	66	52	55	85	54	54	.273	.346	.207	29.226	29.166	29.130	29.174
26	57	69	61	62⅓	69	48	66	.322	.336	.354	29.111	29.038	29.028	29.059
27	51	53	50	51⅓	100	100	86	.374	.403	.309	29.012	28.980	28.938	28.977
28	49	58	50	52⅓	71	53	32	.247	.255	.117	28.985	29.000	29.080	29.022
29	48	65	54	55⅔	100	73	74	.335	.451	.308	29.172	29.125	29.103	29.133
30	55	69	62	62	87	48	72	.376	.336	.399	29.091	29.018	28.905	29.005
31	61	67	50	59⅓	88	74	65	.473	.489	.234	28.609	28.645	28.708	28.654
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	52.°73	75	57	67	.256	.303	.248	--------	--------	--------	29.077
Average					66			.269			--------			

THE MONTH OF MAY, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
60	Cu. St.	90	Cu.	10	Cir.	S W	12	S W	20	----	0	56	28	------	------	------	----
00	--------	10	St.	00	--------	S W	8	W	12	----	0	51	30	------	------	------	----
10	St.	30	Cir.	100	Nim.	S	8	S W	12	S W	8	65	37	------	------	------	----
100	St.	100	St.	100	St.	S W	4	E	2	S W	8	59	38	------	------	------	----
80	St.	80	Cir. Cu.	10	Cir.	N E	8	N E	16	N E	12	59	35	------	------	------	----
100	St.	100	St.	00	--------	N E	12	N E	12	N	2	59	35	------	------	------	----
10	St.	10	Cir.	10	Cir.	E	4	E	16	----	0	68	50	------	------	------	----
100	Nim.	100	Nim.	00	--------	E	8	E	5	----	0	74	52	7 A. M.	4 P. M.	.26	----
80	St.	100	Cu. St.	100	St.	S E	8	S	12	----	0	76	54	------	------	------	----
100	Nim.	100	Nim.	100	--------	E	3	E	8	----	0	61	43	5 A. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	N E	12	N E	12	N E	12	45	41	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	N E	12	N E	16	N E	16	45	40	------	10 P. M.	1.72	----
100	Nim.	100	Cu. St.	100	Cu. St.	N E	16	N E	16	N	8	48	42	------	------	------	----
50	Cu. St.	20	Cir. St.	20	St.	N E	16	N E	16	N E	12	60	38	------	------	------	----
10	Cir.	40	Cu.	00	--------	N E	8	N E	12	----	0	54	30	------	------	------	----
00	--------	00	--------	20	St.	----	0	N	8	W	5	62	38	------	------	------	----
00	--------	00	--------	20	St.	----	0	N	6	N E	3	74	39	------	------	------	----
00	--------	00	--------	10	St.	E	4	S E	6	----	0	74	42	------	------	------	----
00	--------	90	Cir. St.	100	St.	----	0	S	6	S E	4	74	52	------	------	------	----
90	St.	20	Cu. St.	50	Cu. St.	S E	3	S E	1	----	0	79	52	------	------	------	----
20	Cu.	30	Cu.	20	Cir.	N W	3	W	6	W	1	68	40	------	------	------	----
100	Cu. St.	100	St.	00	--------	E	8	W	12	----	0	52	34	------	------	------	----
30	Cu.	80	Cu.	00	--------	N W	12	W	16	----	0	51	32	------	------	------	----
10	St.	70	Cu. St.	100	Cu. St.	S W	4	S W	4	----	0	61	36	------	------	------	----
00	--------	30	Cu.	10	Cir.	----	0	S W	8	----	0	68	42	------	------	------	----
40	Cir. Cu.	60	Cu. St.	100	St.	S W	6	S W	8	----	0	73	50	11 P. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	E	4	E	8	E	12	53	45	------	7 P. M.	1.83	----
100	Cu. St.	60	Cu. St.	10	St.	N	6	N E	12	----	0	58	38	------	------	------	----
00	--------	20	Cir.	00	--------	----	0	W	8	----	0	69	43	------	------	------	----
80	Cir. Cu.	70	Cu. St.	20	Cir. Cu.	S W	8	S W	12	----	0	73	55	In Night.	------	.23	----
100	Cu. St.	90	Cu. St.	100	Cu. St.	S W	12	S W	12	N	12	66	42	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
54	--------	61	--------	44	--------	----	----	----	----	----	----	------	------	------	------	4.04	----
			53														

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	53	65	48	55⅓	54	40	93	.219	.244	.310	28.845	28.852	28.895	28.864
2	56	62	53	57	87	100	100	.262	.556	.403	28.931	28.931	28.923	28.928
3	55	66	48	56⅓	100	69	100	.433	.438	.335	28.658	28.579	28.625	28.621
4	46	49	48	47⅔	100	78	100	.311	.271	.335	28.696	28.733	28.878	28.769
5	53	65	52	56⅔	93	35	73	.375	.216	.282	29.013	29.025	29.025	29.021
6	57	76	58	63⅔	69	49	88	.322	.436	.422	29.093	29.012	28.980	29.028
7	68	76	67	70⅓	51	41	89	.350	.396	.591	28.980	28.942	28.892	28.938
8	63	75	65	67⅔	83	52	84	.478	.449	.516	28.885	28.862	28.818	28.855
9	62	76	68	68⅔	46	41	60	.256	.396	.411	28.942	28.940	28.878	28.920
10	63	69	53	61⅔	47	56	61	.270	.398	.244	28.918	29.012	29.070	29.000
11	63	67	57	62⅓	42	33	75	.243	.217	.350	29.184	29.176	29.183	29.181
12	62	74	60	65⅓	46	47	49	.256	.398	.255	29.224	29.158	29.126	29.169
13	63	75	70	69⅓	83	68	85	.478	.591	.622	29.148	29.095	29.047	29.097
14	68	78	72	72⅔	90	73	67	.612	.704	.524	28.970	28.872	28.767	28.870
15	67	78	68	71	84	65	84	.556	.625	.577	28.812	28.887	28.895	28.865
16	66	86	66	72⅔	95	51	84	.604	.636	.536	28.905	28.867	28.807	28.860
17	67	72	66	68⅓	89	80	79	.591	.631	.522	28.670	28.703	28.685	28.686
18	68	82	72	74	84	63	58	.577	.390	.455	28.612	28.546	28.604	28.587
19	53	62	54	56⅓	73	56	74	.295	.312	.308	28.860	28.992	29.128	28.993
20	58	66	59	61	70	50	70	.336	.316	.351	29.299	29.241	29.241	29.260
21	60	71	62	64⅓	77	58	77	.396	.436	.429	29.244	29.241	29.255	29.247
22	64	81	77	74	72	59	61	.343	.624	.564	29.251	29.190	29.122	29.188
23	69	84	74	75⅔	95	61	81	.671	.704	.679	29.140	29.122	29.107	29.123
24	73	72	78	74⅓	85	90	95	.693	.706	.914	29.067	29.027	28.964	29.019
25	75	84	74	77⅔	90	64	81	.784	.746	.679	28.937	28.972	28.995	28.968
26	66	80	68	71⅓	84	48	79	.536	.487	.543	29.047	29.130	29.120	29.099
27	63	80	65	69⅓	72	51	94	.416	.524	.583	29.168	29.109	29.060	29.102
28	66	76	67	69⅔	89	56	89	.569	.505	.591	29.055	29.042	29.042	29.046
29	65	78	67	70	78	54	74	.483	.514	.489	29.077	29.044	29.027	29.049
30	63	77	71	70⅓	94	82	95	.542	.757	.720	28.860	28.700	28.702	28.754
......	......	......	......	......	......	......	......	......	......	......	....	....	....	....
Sums.	......	......	......	......	......	......	......	......	......	......	....	....	....	....
Means	......	......	......	66°.49	77	59	80	.442	.487	.485	....	....	....	28 971
Average					72			.471			....			

THE MONTH OF JUNE, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOME'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
00	--------	20	Cu.	10	Cu.	N W	8	N W	16	----	0	65	48	In	night.	.10	----
80	Cu. St.	100	Nim.	100	Nim.	S W	8	S W	5	S W	8	62	50	10 A. M.	------	------	----
100	Nim.	60	Cu. St.	100	Nim.	S W	16	S W	8	S W	8	67	45	------	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	S W	12	S W	16	W	16	56	45	------	night.	2.38	----
70	Cir.Cu.	60	Cir.Cu.	00	--------	W	8	N W	16	N W	4	70	48	------	------	------	----
00	--------	20	Cir.	00	--------	W	3	S W	12	----	0	80	52	------	------	------	----
20	Cir.Cu.	20	Cir.Cu.	00	--------	W	8	W	20	W	8	80	63	8 A. M.	3 P. M.	.35	----
100	Cu. St.	60	Cir.Cu.	80	Cir.Cu.	W	8	W	16	W	3	77	58	------	------	------	----
50	Cir. St.	10	Cir.	90	Cir. St.	----	0	S W	6	W	6	77	57	------	------	------	----
60	Cir. St.	80	Cir. St.	100	Cu. St.	N E	6	N	8	N	1	69	44	------	------	------	----
10	Cir.	80	Cir. St.	00	--------	E	6	E	6	----	0	70	50	------	------	------	----
50	Cir. St.	20	Cir.Cu.	00	--------	N E	4	N E	6	----	0	75	52	------	------	------	----
100	Cu. St.	90	Cu. St.	100	Cu. St.	S E	2	S E	12	S E	8	77	44	------	------	------	----
70	Cu. St.	80	Cu. St.	00	--------	S W	8	S	12	S E	12	84	66	------	------	------	----
100	Cu. St.	60	Cu. St.	00	--------	S W	8	W	16	----	0	80	60	------	------	------	----
10	St.	40	Cu. St.	00	--------	W	1	W	8	----	0	86	62	------	------	------	----
100	Cu. St.	100	Cu. St.	60	Cu. St.	S W	8	S W	8	----	0	75	60	------	------	------	----
80	St.	60	Cu. St.	80	Cu. St.	S W	4	W	16	S W	12	82	50	2:30 P. M.	4 P. M.	.10	----
100	Cu. St.	40	Cu. St.	00	--------	N W	12	N W	8	----	0	62	46	------	------	------	----
60	Cir.Cu.	100	St.	100	St.	S	6	E	5	----	0	70	49	------	------	------	----
90	St.	100	St.	00	--------	S E	5	E	2	----	0	74	56	------	------	------	----
90	Cu. St.	40	Cu.	00	--------	S E	2	S	8	----	0	82	64	In	night.	.40	----
80	Cu. St.	20	Cu.	----	Cir. St.	S	2	S W	4	----	0	85	65	------	------	------	----
60	St.	100	Nim.	20	St.	S	8	S W	12	----	0	86	67	1 P. M.	------	------	----
30	St.	30	Cu.	100	Cu. St.	W	8	W	8	----	0	87	62	------	3 A. M.	1.06	----
100	St.	30	Cu.	20	St.	W	6	N W	8	----	0	82	54	5 P. M.	12 P. M.	.46	----
10	St.	10	St.	10	St.	E	4	S	3	----	0	84	62	------	------	------	----
70	St.	40	Cir.	20	St.	N	4	N E	3	----	0	76	61	------	------	------	----
10	St.	30	Cu.	30	Cir. St.	E	3	N E	4	N E	4	82	62	------	------	------	----
100	Nim.	100	Cu. St.	20	St.	S	12	W	12	----	0	77	61	6 A. M.	1 P. M.	.72	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	---	----	------	------	------	------	5.57	----
63	--------	57	--------	40	--------	----	----	----	----	----	----	------	------	------	------	------	----

53

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, In Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	64	73	56	64⅓	83	59	75	.497	.476	.335	28.812	28.877	29.092	28.927
2	58	73	59	63⅓	88	55	88	.422	.442	.439	29.186	29.151	29.100	29.146
3	58	66	57	60⅓	88	64	100	.422	.407	.466	29.075	29.038	29.060	29.058
4	56	66	56	59⅓	87	41	75	.391	.259	.335	29.073	29.188	29.130	29.130
5	55	70	62	62⅓	87	53	77	.376	.385	.429	29.151	29.112	29.115	29.126
6	60	75	64	66⅓	82	48	68	.426	.415	.403	29.154	29.145	29.090	29.130
7	63	72	65	66⅔	78	67	89	.447	.524	.549	29.061	29.007	29.000	29.023
8	64	72	69	68⅓	100	80	95	.596	.631	.671	29.011	29.027	29.060	29.033
9	73	82	76	77	76	60	82	.618	.650	.731	29.117	29.057	28.994	29.056
10	71	82	68	73⅔	95	49	70	.720	.534	.476	28.930	28.877	28.870	28.892
11	69	78	64	70⅓	70	36	68	.495	.342	.403	28.892	28.930	28.950	28.924
12	64	73	58	65	94	59	76	.562	.476	.365	28.935	28.877	28.895	28.902
13	60	72	62	64⅔	88	62	67	.456	.489	.369	28.933	28.958	29.048	28.980
14	56	70	58	61⅓	81	53	82	.363	.385	.393	29.204	29.201	29.236	29.214
15	55	76	67	66	87	45	64	.376	.402	.425	29.286	29.243	29.211	29.247
16	70	80	65	71⅔	70	59	100	.516	.598	.617	29.092	29.069	29.112	29.091
17	67	80	68	71⅔	89	59	70	.591	.598	.476	29.122	29.125	29.105	29.117
18	65	78	63	68⅔	73	54	78	.451	.514	.655	29.033	29.007	29.012	29.017
19	63	73	60	65⅓	78	50	71	.447	.409	.367	29.025	29.135	29.164	29.108
20	56	73	62	63⅔	81	43	36	.363	.345	.340	29.189	29.181	29.198	29.189
21	56	73	61	63⅓	81	55	82	.363	.442	.443	29.249	29.241	29.246	29.245
22	58	78	67	67⅔	88	46	74	.422	.443	.489	29.324	29.295	29.291	29.303
23	66	81	65	70⅔	74	48	84	.470	.510	.516	29.344	29.277	29.228	29.283
24	64	82	69	71⅔	83	46	75	.497	.497	.529	29.241	29.164	29.128	29.178
25	65	83	72	73⅓	84	46	71	.516	.520	.559	29.155	29.169	29.134	29.153
26	71	85	68	74⅔	75	57	79	.572	.691	.543	29.183	29.147	29.142	29.157
27	74	86	68	76	72	51	100	.631	.636	.685	29.125	29.051	29.062	29.079
28	70	80	63	71	90	51	67	.658	.524	.386	29.050	29.065	29.138	29.084
29	62	70	66	66	77	61	79	.423	.449	.502	29.185	29.205	29.231	29.207
30	66	77	64	69	63	46	89	.438	.422	.529	29.246	29.198	29.193	29.212
31	64	67	66	65⅔	83	89	95	.497	.591	.604	29.171	29.151	29.102	29.141
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	67°.71	82	55	72	.485	.485	.485	--------	--------	--------	29.108
Average					72			.485			----------------			

THE MONTH OF JULY, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
90	Cu. St.	80	Cu.	10	St.	N W	8	N W	12	N	4	74	46	------	------	------	----
00	--------	20	Cu.	100	Cu. St.	N W	2	W	8	W	3	77	57	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	S W	4	N E	1	N E	1	66	49	5 P. M.	10 P. M.	.20	----
00	--------	20	Cu.	60	Cir. Cu.	N	6	N E	12	----	0	66	49	------	------	------	----
10	St.	70	Cu. St.	00	--------	N	4	N	8	----	0	72	51	------	------	------	----
00	--------	50	Cir. St.	00	--------	----	0	S W	8	----	0	78	56	------	------	------	----
30	Cir. St.	100	Cu. St.	100	Nim.	S	8	S W	12	S W	6	72	62	4 P. M.	------	------	----
100	Nim.	100	Nim.	100	St.	S E	5	S	2	----	0	73	68	------	4 P. M.	.07	----
20	St.	30	Cu.	50	Cu.	S W	3	S W	6	S W	8	84	70	------	------	------	----
100	Nim.	00	--------	00	--------	W	8	S W	12	W	2	86	63	3 A. M.	8 A. M.	.22	----
00	--------	00	--------	10	St.	W	8	W	16	W	4	81	62	------	------	------	----
100	Nim.	80	Cu. St.	00	--------	S	4	S W	12	----	0	73	53	5 A. M.	8 A. M.	.07	----
80	Cu. St.	100	Cu. St.	60	Cir. St.	S W	3	S W	8	----	0	73	49	------	------	------	----
10	St.	60	Cu.	00	--------	N	3	N	2	----	0	71	47	------	------	------	----
00	--------	30	Cu.	100	Cu. St.	----	0	S W	3	----	0	79	53	------	------	------	----
20	St.	50	Cir. Cu.	100	Cu. St.	S	8	S	12	S W	4	81	65	5 P. M.	7 P. M.	.72	----
100	St.	50	Cu.	10	Cir. Cu.	S W	1	S	3	----	0	81	65	------	------	------	----
50	Cu.	30	Cu.	00	--------	S	4	S W	16	----	0	80	59	------	------	------	----
30	Cir. Cu.	30	Cu.	00	--------	S W	4	S W	12	----	0	78	48	------	------	------	----
20	St.	80	Cu.	00	--------	W	2	W	12	----	0	76	49	------	------	------	----
00	--------	70	Cu.	00	--------	S W	4	W	8	----	0	80	51	------	------	------	----
00	--------	10	Cu.	10	St.	W	1	W	2	----	0	78	55	------	------	------	----
00	--------	70	Cu. St.	10	St.	----	0	W	1	----	0	85	57	------	------	------	----
00	--------	80	Cu.	00	--------	W	4	S W	2	----	0	82	60	------	------	------	----
00	--------	20	Cu.	20	Cu.	W	6	S W	8	----	0	84	63	------	------	------	----
00	--------	40	Cu. St.	10	Cir.	S W	4	S W	12	----	0	85	65	------	------	------	----
00	--------	60	Cir. Cu.	100	Nim.	S W	4	S W	12	S W	1	89	67	5 P. M.	10 P. M.	.22	----
100	St.	40	Cu.	00	--------	----	0	N W	12	N	8	80	56	------	------	------	----
00	--------	100	St.	5	St.	N	6	N	8	N	8	74	51	------	------	------	----
50	Cir. St.	60	Cir. St.	60	Cir. St.	E	3	S E	2	----	0	80	60	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	E	2	E	14	----	0	70	63	7 A. M.	12 P. M.	.82	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	2,32	----
36	--------	56	--------	36	--------	----	----	----	----	----	----	------	------	------	------	------	----

43

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	70	78	67	71⅔	100	78	89	.733	.744	.591	29.067	29.072	29.065	29.068
2	67	73	70	70	100	90	90	.662	.731	.658	29.027	29.015	28.985	29.009
3	70	79	71	73⅓	95	66	85	.695	.651	.644	29.007	28.974	29.030	29.004
4	67	75	71	71	100	81	90	.662	.704	.682	29.025	29.020	29.060	29.035
5	69	80	68	72⅓	100	78	95	.708	.800	.648	29.120	29.120	29.128	29.128
6	72	80	68	73⅓	95	82	100	.745	.843	.685	29.160	29.138	29.110	29.136
7	68	82	68	72⅔	95	75	90	.648	.816	.612	29.062	28.922	28.930	28.971
8	66	69	58	64⅓	100	70	82	.639	.495	.393	28.837	28.805	28.902	28.848
9	56	64	54	58	87	73	87	.391	.433	.362	28.913	28.963	28.988	28.955
10	54	65	53	57⅓	93	68	86	.389	.420	.348	29.033	29.083	29.135	29.084
11	53	71	57	60⅓	86	58	75	.348	.436	.350	29.162	29.102	29.095	29.120
12	61	75	64	66⅔	83	77	100	.443	.666	.596	29.033	29.012	29.062	29.036
13	64	81	65	70	94	59	94	.562	.624	.583	29.110	29.072	29.042	29.075
14	66	80	69	71⅔	84	70	90	.536	.717	.635	29 010	28.985	28.965	28.987
15	71	79	64	71⅓	90	74	94	.682	.730	.562	29 005	28.967	28.942	28.971
16	68	79	65	70⅔	100	74	94	.685	.730	.583	28.972	28.955	29.017	28.981
17	63	75	64	67⅓	83	56	89	.478	.483	.529	29.115	29.125	29.133	29.124
18	51	73	66	63⅓	93	55	64	.348	.442	.407	29.193	29.180	29.170	29.181
19	61	68	64	64⅓	94	79	89	.505	.543	.569	29.209	29.223	29.113	29.182
20	70	85	72	75⅔	85	61	80	.622	.733	.631	29.204	29.264	29.298	29.255
21	69	82	69	73⅓	90	60	95	.635	.650	.671	29.291	29.260	29.275	29.275
22	72	85	71	76	90	61	85	.706	.733	.644	29.191	29.144	29.072	29.136
23	72	82	67	73⅔	95	67	95	.745	.731	.626	28.982	29.062	29.074	29.039
24	74	80	68	74	72	59	90	.604	.598	.612	29.080	29.072	29.067	29.073
25	65	82	66	71	94	67	95	.583	.731	.604	29.052	28.969	29.074	29.032
26	67	80	67	71⅓	85	66	89	.622	.677	.591	29.082	28.927	29.040	29.016
27	68	77	67	70⅔	84	69	89	.577	.639	.591	29.067	29.060	28.969	29.032
28	67	78	68	71	89	57	84	.591	.550	.577	29.145	29.117	29.115	29.126
29	63	77	57	65⅔	94	53	94	.512	.492	.436	29.165	29.142	29.185	29.164
30	62	78	66	68⅔	94	61	89	.523	.588	.569	29.171	29.110	29.110	29.130
31	65	79	79	74⅓	94	74	95	.583	.730	.945	29.082	29.070	29.158	29.103
Sums.	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	69°.52	92	68	89	.589	.641	.578	--------	--------	--------	29.074
Average----------------					83			.603			------------------------------			

THE MONTH OF AUGUST, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	Nim.	80	Cu. St.	100	Cu. St.	S	1	S W	1	----	0	83	67	5 P. M. Thun.	storm.	.05	----
100	Nim.	100	Nim.	100	Nim.	S E	1	E	2	S E	1	75	67	6 A. M	------	------	----
100	Nim.	70	Cir. Cu.	100	St.	E	8	E	8	E	2	81	65	------	------	.60	----
100	Nim.	80	Cu. St.	10	St.	E	1	E	1	----	0	77	66	------	5 P. M.	.48	----
100	Nim.	80	Cu. St.	50	St.	E	1	E	2	----	0	85	63	5 P. M.	8 P. M.	2.55	----
70	Cir. Cu.	100	Cu. St.	10	Cir.	E	1	E	2	----	0	82	62	------	------	------	----
40	Cir. Cu.	60	Cu. St.	00	--------	W	1	S W	4	----	0	83	64	1 P. M.	1:30 P. M.	.15	----
100	Nim.	70	Cu. St.	00	--------	----	0	N	1	N	3	75	54	Thun.	storm.	1.18	----
100	St.	100	Cu. St.	10	St.	W	4	W	12	----	0	67	52	------	------	------	----
100	Nim.	50	Cu.	00	--------	N W	8	N	6	N	1	72	52	2 A. M.	10 A. M.	.11	----
00	--------	50	Cu.	00	--------	S W	4	S W	8	----	0	72	52	------	------	------	----
60	St.	100	Nim.	30	St.	S	12	W	12	----	0	75	57	------	------	------	----
100	St.	60	Cu. St.	00	--------	N	8	S W	8	----	0	81	61	------	------	------	----
100	St.	20	Cir. Cu.	30	St.	S	17	S W	12	S W	2	82	64	------	------	------	----
20	St.	100	Cu. St.	10	St.	S W	8	S W	8	----	0	85	63	------	------	------	----
100	St.	90	Cu. St.	30	St.	S W	8	S W	8	----	0	79	57	3 P. M.	4 P. M.	.30	----
00	--------	20	Cu.	00	--------	N	4	N	2	----	0	75	49	------	------	------	----
10	St.	10	Cu.	00	--------	N	2	N	4	E	1	77	55	------	------	------	----
75	Cu. St.	100	Cu. St.	95	Cu.	S	2	S E	6	E	1	79	60	------	------	------	----
50	Cir. Cu.	35	Cu.	15	Cir. & Cu.	E	3	S W	8	N W	4	73	51	------	------	------	----
80	Cir. Cu.	80	Cu.	10	Hazy. Cu.	S W	4	W	8	----	0	85	79	------	------	------	----
20	Cir. & Cu.	75	Cir. & Cu. St.	100	Nim.	S W	6	S W	8	S W	6	82	62	9 P. M.	11 P. M.	.20	----
50	Cir. & Cu.	50	Cir. & Cu.	5	Cir.	W	5	N	7	N E	3	85	62	------	------	------	----
50	Cu.	25	Cu.	5	Cu.	E	5	N E	5	----	0	87	64	------	------	------	----
00	--------	50	Cu.	5	Cir.	----	0	S W	7	S E	6	82	52	------	------	------	----
75	Cir. Cu.	75	Cir., Cu. & St.	00	--------	S E	5	S W	11	N	5	80	64	------	------	------	----
100	Cu. St.	60	Cu.	00	--------	N	5	N	7	N E	6	80	60	------	------	------	----
100	Cu. St.	40	Cu.	10	Cu.	N E	8	E	12	E	8	78	56	------	------	------	----
00	--------	00	--------	5	Cir.	N E	9	E	0	----	0	78	55	------	------	------	----
10	Cir. Cu.	80	Cir. St.	90	Cu. St.	----	0	S E	14	----	0	78	62	------	------	------	----
100	St.	70	Cu. St.	100	Nim.	----	0	S E	10	----	0	81	62	3 P. M.	9 P. M.	.10	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	5.72	----
67	--------	64	--------	30	--------	----	----	----	----	----	----	------	------	------	------	------	----

51

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	64	71	64	66⅓	94	80	94	.562	.608	.562	29.102	29.141	29.132	29.125
2	67	70	57	64⅔	95	80	94	.626	.586	.436	29.018	29.042	29.108	29.056
3	57	76	66	66⅓	94	52	95	.436	.470	.604	29.172	29.092	29.080	29.115
4	59	70	55	61⅓	100	80	87	.500	.586	.376	29.196	29.241	29.283	29.240
5	52	72	57	60⅓	100	58	94	.388	.455	.436	29.379	29.345	29.303	29.342
6	52	76	60	62⅔	100	60	88	.388	.542	.456	29.304	29.218	29.171	29.231
7	56	75	62	64⅓	100	60	94	.449	.519	.523	29.140	29.105	29.102	29.116
8	61	67	53	60⅓	88	60	86	.473	.393	.348	29.166	29.173	29.201	29.180
9	46	68	52	55⅓	100	51	100	.311	.350	.388	29.217	29.196	29.184	29.199
10	58	67	57	60⅔	94	69	81	.452	.457	.378	29.162	29.156	29 135	29.151
11	52	66	50	56	100	50	100	.388	.316	.361	29.151	29.123	29.189	29.154
12	43	69	55	55⅔	100	52	87	.278	.367	.376	29.225	29.188	29.156	29.190
13	57	67	60	61⅓	81	74	100	.378	.489	.518	29.033	28.918	28.945	28.965
14	67	77	59	67⅔	84	46	82	.556	.422	.409	28.758	29.907	29.032	29.232
15	48	71	54	57⅔	100	53	93	.335	.403	.389	29.214	29.225	29.228	29.222
16	53	76	64	64⅓	93	56	94	.375	.505	.562	29.254	29.198	29.208	29.220
17	63	82	67	70⅔	94	63	89	.542	.390	.591	29.198	29.007	28.982	29.062
18	64	84	77	75	94	68	69	.562	.789	.639	28.992	28.956	28.942	28.963
19	72	77	61	70	95	65	94	.745	.601	.505	28.920	28.967	29.058	28.982
20	53	65	56	58	100	68	87	.403	.420	.391	29.198	29.218	29.278	29.231
21	53	61	57	57	100	88	100	.403	.473	.466	29.284	29.242	29.154	29.227
22	45	63	45	51	100	57	100	.299	.327	.299	29.167	29.141	29.199	29.169
23	43	61	44	49⅓	92	45	92	.254	.242	.264	29.255	29.272	29.312	29.280
24	40	60	51	50⅓	100	44	65	.248	.229	.245	29.425	29.434	29.436	29.432
25	45	62	47	51⅓	92	56	85	.275	.312	.273	29.517	29.512	29.499	29.509
26	39	58	45	47⅓	100	76	81	.238	.365	.251	29.502	29.437	29.379	29.439
27	41	60	52	51	100	60	79	.257	.310	.308	29.292	29.250	29.192	29.245
28	54	65	55	58	100	68	87	.418	.420	.376	29.154	29.154	29.184	29.164
29	57	67	66	63⅓	94	79	95	.436	.522	.604	29.219	29.224	29.228	29.224
30	56	71	59	62	94	71	100	.420	.537	.500	29.258	29.278	29.308	29.281
------	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	59°.98	96	63	90	.413	.447	.427	--------	--------	--------	29.198
Average ------------------					83			.429			------------------------------------			

THE MONTH OF SEPTEMBER, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	100	St.	50	St.	W	4	----	0	----	0	78	61	------	------	------	----
50	Cir.Cu.	100	St.	10	Cir.Cu.	S E	8	S W	8	----	0	75	49	------	------	------	----
00	--------	20	Cu.	100	Cu. St.	S W	2	S W	12	S W	1	76	56	7 P. M.	9 P. M.	.18	----
100	Cu. St.	40	Cu.	00	--------	N	2	N	5	----	0	70	46	------	------	------	----
----	Fog.	40	Cu.	00	--------	----	0	N E	1	----	0	75	48	------	------	------	----
00	--------	10	Cu.	00	--------	----	0	S W	2	----	0	76	51	------	------	------	----
20	St.	40	Cir. St.	00	--------	----	0	W	1	----	0	76	56	------	------	------	----
100	Cu. St.	40	Cu.	00	--------	E	4	N	4	N E	2	67	41	------	------	------	----
00	--------	00	--------	00	--------	----	0	N	0	----	0	70	46	------	------	------	----
30	St.	50	Cu.	00	--------	N	1	N E	6	N E	3	70	50	------	------	------	----
00	--------	60	Cu.	00	--------	N	3	N	6	----	0	69	38	------	------	------	----
00	--------	50	Cu.	50	St.	----	0	S E	4	----	0	70	43	------	------	------	----
100	Cu. St.	100	Cu. St.	00	--------	S	12	S	1	----	0	67	57	------	------	------	----
00	--------	10	Cu.	00	--------	W	12	W	16	----	0	77	44	------	------	------	----
00	--------	00	--------	00	--------	----	0	N W	1	----	0	72	46	------	------	------	----
40	Cir.	60	Cir. St.	100	St.	----	0	W	1	----	0	77	52	------	------	------	----
40	Cir.Cu.	80	Cu. St.	50	St.	S W	2	S W	12	----	0	83	61	------	------	------	----
00	--------	10	Cu.	00	--------	----	0	S W	12	S W	12	85	65	------	------	------	----
50	St.	80	Cir.Cu.	00	--------	S W	S	S W	8	----	0	77	49	Show	er.	.05	----
100	Fog.	100	Cu. St.	100	St.	----	0	S	1	S	3	67	52	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	E	2	E	2	----	0	62	45	7 P. M.	12 M.	.38	----
00	--------	50	Cu.	00	--------	W	4	S W	12	----	0	63	40	------	------	------	----
10	Cu.	50	Cu.	00	--------	----	0	W	8	----	0	63	32	------	------	------	----
00	--------	20	Cu.	00	--------	----	0	E	1	E	1	61	38	------	------	------	----
90	Cu.	100	Cu. St.	00	--------	E	1	N E	5	N E	1	62	38	------	------	------	----
00	--------	60	Cu.	70	Cu. St.	N	2	N E	1	N E	2	60	39	------	------	------	----
70	Cir. St.	100	Cu. St.	20	Cir.	N	4	N E	4	E	3	61	41	------	------	------	----
100	Nim.	80	Cu. St.	00	--------	----	0	S E	8	----	0	67	54	------	------	------	----
100	St.	100	Cu. St.	100	Nim.	E	2	E	2	----	0	70	55	6 P. M.	9 P. M.	.06	----
100	St.	100	St.	00	--------	E	1	E	1	----	0	73	45	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	.67	----
45	--------	58	--------	26	--------	----	----	----	----	----	----	------	------	------	------	------	----
			43														

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or per cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	54	72	60	62	93	62	77	.389	.489	.396	29.359	29.325	29.233	29.307
2	48	68	51	56⅔	100	60	93	.335	.411	.389	29.362	29.336	29 361	29.353
3	52	60	52	54⅔	100	88	93	.388	.456	.361	29.395	29.344	29.321	29.353
4	50	72	57	59⅔	100	62	94	.361	.489	.436	29.358	29.285	29.302	29.315
5	53	68	61	60⅔	100	95	100	.403	.648	.537	29.347	29.321	29.326	29.331
6	53	74	62	63	100	68	91	.403	.568	.523	29.311	29.268	29.235	29.271
7	61	76	64	67	83	56	73	.473	.505	.433	29.184	29.070	29.068	29.107
8	64	74	68	68⅔	78	68	70	.465	.568	.476	29.000	28.902	28.792	28.898
9	61	58	47	55⅓	88	76	92	.473	.365	.297	28.815	28.995	29.166	28.992
10	43	57	47	49	100	75	100	.278	.350	.323	29.182	29.098	29.048	29.109
11	43	55	50	49⅓	100	68	86	.278	.321	.309	29.113	29.115	29.151	29.126
12	43	64	59	55⅓	100	73	91	.278	.433	.469	29.149	29.028	28.951	29.043
13	63	58	52	57⅔	83	94	86	.478	.452	.334	28 861	28.860	28.988	28.903
14	44	66	54	54⅔	92	43	74	.264	.287	.308	29.232	29.210	29.194	29.214
15	47	65	55	55⅔	85	49	81	.273	.300	.349	29.194	29.208	29.120	29.174
16	56	66	60	60⅔	87	69	100	.391	.438	.518	29.065	28.968	28.950	28.994
17	50	65	42	52⅓	86	73	83	.309	.451	.221	29.078	29.123	29.148	29.116
18	41	67	44	50⅔	91	64	84	.235	.425	.241	29.212	29.156	29.214	29.194
19	40	64	34	46	82	78	79	.203	.465	.155	29.304	29.304	29.332	29.313
20	42	66	37	48⅓	91	64	81	.244	.407	.178	29.318	29.266	29.282	29.289
21	39	57	42	46	82	52	83	.194	.242	.221	29.322	29.262	29.111	29.232
22	48	54	47	49⅔	78	74	77	.260	.308	.249	28.968	28.993	29.058	29.006
23	44	51	34	43	84	53	90	.241	.196	.175	29.073	29.053	29.083	29.070
24	27	50	38	38⅓	100	52	81	.147	.186	.186	29.133	29.138	29.123	29.131
25	45	61	50	52	61	61	93	.182	.225	.335	28.953	28.803	28.873	28.876
26	32	50	35	39	89	45	90	.162	.162	.183	29.164	29.212	29.212	29.196
27	39	54	34	42⅓	82	38	90	.194	.157	.175	29.187	29.131	29.189	29.169
28	31	53	52	45⅓	100	80	100	.174	.268	.383	29.172	28.983	28.752	28.969
29	43	48	39	43⅓	83	63	91	.231	.212	.216	28.836	28.938	29.013	28.929
30	40	55	53	51	91	62	82	.225	.269	.393	29.048	28.953	28.731	28.911
31	63	61	42	55⅓	89	40	74	.510	.242	.199	28.765	28.925	29.151	28.947
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	52 °67	90	65	87	.305	.364	.322	--------	--------	--------	29.124
Average					81			.330						

THE MONTH OF OCTOBER, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOME'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
00	--------	80	Cu. St.	00	--------	N	1	E	1	----	0	73	44	------	------	------	----
100	St.	70	Cir. St.	50	St.	----	0	E	2	N E	2	69	48	------	------	------	----
100	Fog.	100	Cu. St.	00	--------	----	0	----	0	----	0	64	44	------	------	------	----
100	Fog.	10	St.	10	St.	----	0	S W	2	----	0	72	49	------	------	------	----
00	--------	60	Cu. St.	00	--------	----	0	S W	1	----	0	77	52	1 P. M.	7 P. M.	.65	----
20	St.	90	Cu. St.	00	--------	----	0	S E	3	----	0	77	53	------	------	------	----
80	Cir. St.	60	Cir. St.	00	--------	S E	3	S W	8	S W	3	76	56	------	------	------	----
20	Cir. Cu.	70	Cir. St.	100	St.	S	5	S W	12	S W	12	74	59	------	------	------	----
100	Nim.	30	Cu.	00	--------	S W	16	N W	12	----	0	61	41	1 A. M.	9 A. M.	.24	----
10	St.	100	Cu. St.	100	Nim.	----	0	E	3	N E	8	60	41	3:30 P. M.	6 A. M.	.50	----
100	Cu. St.	100	Cu. St.	90	Cu. St.	N	4	N E	4	N E	4	56	42	------	------	------	----
20	St.	80	Cu.	20	St.	E	1	S	4	S	8	64	43	------	------	------	----
90	St.	100	Cu. St.	00	--------	S	8	S E	8	----	0	68	38	11 A. M.	2 P. M.	.35	----
00	--------	00	--------	00	--------	----	0	S W	8	S W	8	67	39	------	------	------	----
00	--------	00	--------	00	--------	S W	1	S W	8	S	6	66	46	------	------	------	----
30	St.	100	Cir. St.	100	Nim.	----	0	S W	12	S W	4	67	45	6 P. M.	10 P. M.	.18	----
100	Cu. St.	20	Cu.	00	--------	----	0	N E	1	----	0	66	33	------	------	------	----
00	--------	95	Cu. St.	100	Cu. St.	----	0	N W	2	----	0	67	32	------	------	------	----
00	--------	00	--------	00	--------	N E	8	N	4	N	1	65	25	------	------	------	----
00	--------	00	--------	70	Cir. St.	N W	4	N W	8	----	0	66	28	------	------	------	----
00	--------	20	Cir. Cu.	30	Cir.	----	0	S	8	S	6	59	37	------	------	------	----
50	Cir.	100	Cu. St.	100	Cu. St.	S	8	W	12	W	8	55	43	------	------	------	----
100	Cu. St.	40	Cir. Cu.	00	--------	----	0	N	4	----	0	52	24	------	------	------	----
100	Fog.	00	--------	00	--------	----	0	N W	2	----	0	51	27	------	------	------	----
80	St.	100	St.	50	St.	S	12	S W	8	----	0	61	31	------	------	------	----
00	--------	80	Cir. St.	00	--------	----	0	W	8	----	0	51	30	------	------	------	----
100	Cu. St.	20	Cir.	00	--------	----	0	W	1	----	0	54	29	------	------	------	----
10	St.	100	Cu. St.	100	Nim.	N E	1	S E	8	S E	16	55	31	7 P. M.	12 M.	.38	----
100	Cu. St.	100	Cu. St.	90	Cu. St.	S W	12	S W	16	S W	2	48	35	------	------	------	----
70	St.	100	Cu. St.	100	Cu. St.	S E	6	S E	12	S E	16	63	40	4 P. M.	------	------	----
100	Nim.	00	--------	00	--------	S W	12	W	16	----	2	63	31	------	8 A. M.	.34	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	2.64	----
51	--------	61	--------	37	--------	----	----	----	----	----	----	------	------	------	------	------	----
		50															

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, in Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor in Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	38	55	41	44⅔	91	68	100	.207	.295	.235	29.177	29.316	29.394	29.296
2	31	42	32	35	89	50	79	.155	.134	.144	29.652	29.647	29.647	29.649
3	32	44	32	36	79	68	89	.144	.195	.162	29.522	29.428	29.436	29.462
4	23	45	35	34⅓	100	46	70	.123	.138	.142	29.460	29.444	29.422	29.442
5	30	49	43	40⅔	100	51	83	.167	.175	.221	29.322	29.232	29.181	29.245
6	42	45	45	44	83	100	100	.221	.299	.299	29.088	28.995	29.081	29,055
7	41	48	45	44⅔	100	85	92	.257	.284	.275	29.182	29.222	29.282	29,229
8	35	52	36	41	100	73	100	.204	.282	.212	29.252	29.237	29.214	29.234
9	40	53	47	46⅔	100	100	100	.248	.403	.323	29.118	28.993	29.048	29.053
10	47	55	56	52⅔	100	56	94	.323	.243	.604	29.113	29.078	29.065	29.085
11	60	68	63	63⅔	100	79	83	.518	.543	.478	28.975	28.928	28.935	28.946
12	56	44	35	45	94	76	100	.420	.335	.204	28.928	28.996	29.023	28.982
13	30	30	27	29	89	89	100	.149	.149	.147	28.986	29.001	29.093	29.027
14	23	37	28	29⅓	100	53	88	.123	.116	.136	29.069	28.934	28.905	28.969
15	30	43	37	36⅔	89	67	90	.149	.186	.199	29.053	29.146	29.232	29.144
16	36	46	37	39⅔	80	62	100	.170	.192	.220	29.154	29.262	29.262	29.226
17	33	36	26	31⅔	100	61	100	.188	.129	.141	29.332	29.367	29.426	29.375
18	15	38	31	28	100	63	100	.086	.144	.174	29.363	29.304	29.309	29.325
19	32	41	27	33⅓	100	57	100	.181	.147	.147	29.327	29.316	29.281	29.308
20	18	37	28	27⅔	100	53	88	.098	.116	.136	29.292	29.183	29.138	29.204
21	30	41	35	35⅓	100	65	70	.167	.168	.142	29.008	28.928	29.003	28.980
22	31	39	35	35	89	73	80	.155	.173	.178	29.003	29.035	29.035	29.024
23	35	36	28	33	80	100	100	.162	.212	.153	28.783	28.755	28.878	28.805
24	30	36	30	32	100	61	78	.167	.129	.130	29.113	29.249	29.423	29.262
25	20	36	30	28⅔	100	61	78	.108	.129	.130	29.448	29.397	29.277	29.374
26	30	34	30	31⅓	100	90	78	.167	.175	.130	28.991	28.893	28.998	28.961
27	30	36	29	31⅔	100	61	89	.130	.129	.142	29.262	29.331	29.334	29.310
28	27	28	25	26⅔	100	88	100	.147	.136	.135	29.267	29.209	29.189	29.222
29	22	28	22	24	100	77	86	.118	.117	.101	29.190	29.224	29.302	29.239
30	22	31	30	27⅔	100	79	78	.118	.126	.130	20.260	29.153	29.111	29.175
------	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	36°.30	95	70	90	.186	.200	.199	--------	--------	--------	29.187
Average---- ---------------					85			.195			------------------------------			

THE MONTH OF NOVEMBER, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
50	Cu. St.	10	St.	00	--------	----	0	N E	2	----	0	55	30	------	------	------	----
10	St.	10	St.	20	St.	N	8	N	3	N E	2	42	28	------	------	------	----
100	St.	30	Cu.	00	--------	E	2	E	1	----	0	44	22	------	------	------	----
00	--------	00	--------	00	--------	----	0	E	3	S E	3	45	23	------	------	------	----
60	Cir. Cu.	90	Cu. St.	100	Cu. St.	E	2	S E	12	N E	4	49	30	------	------	------	----
100	Cu. St.	100	Nim.	100	Cu. St.	S E	12	S E	3	----	0	45	40	9 A. M.	11 P. M.	.36	----
100	Cu. St.	80	Cu. St.	100	St.	S W	1	S	1	----	0	50	31	------	------	------	----
60	Cir. Cu.	100	Cu. St.	00	--------	----	0	S W	4	----	0	54	32	------	------	------	----
100	Fog.	100	Fog.	100	St.	----	0	----	0	E	4	55	39	------	------	------	----
100	Fog.	100	Cu. St.	100	St.	----	0	S	8	S	6	60	46	------	------	------	----
100	Cu. St.	100	Cu. St.	50	St.	S	8	S	16	S W	16	70	55	10 P. M.	------	------	----
100	Nim.	100	Cu. St.	100	Cu. St.	S W	12	S W	8	W	12	56	29	------	8 A. M.	.55	----
100	Cu. St.	100	Nim.	100	Cu. St.	S W	20	S W	20	N W	4	31	23	------	------	------	----
00	--------	100	St.	00	--------	S W	12	S W	16	----	0	39	23	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Cu. St.	S W	1	W	4	----	0	43	39	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	S	4	----	0	----	0	46	31	6 P. M.	------	------	----
100	Nim.	100	Cu. St.	00	--------	N E	8	S E	12	----	0	36	14	------	9 A. M.	.46	----
00	--------	100	Cu. St.	100	St.	----	0	W	2	----	0	39	15	------	------	------	----
100	St.	90	St.	10	St.	----	0	N	3	----	0	41	16	------	------	------	----
10	St.	10	St.	30	Cir. Cu.	----	0	S E	4	----	0	37	18	------	------	------	----
90	St.	100	Cu. St.	100	Cu. St.	----	0	S W	8	W	2	42	28	------	------	------	----
100	St.	100	St.	100	St.	----	0	S W	1	S W	1	40	30	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	S	12	S W	20	S W	28	37	28	7 A. M.	9 P. M.	.12	----
90	Cu. St.	60	Cu. St.	100	St.	W	12	W	12	W	8	37	20	------	------	------	----
20	St.	90	Cu.	80	St.	----	0	S W	3	S	6	36	20	5 A. M.	3 P. M.	.34	4
100	Nim.	100	Nim.	100	St.	----	0	W	8	W	16	34	22	------	------	------	----
100	St.	70	Cu.	100	St.	NW	1	N E	1	----	0	37	27	------	------	------	----
100	St.	100	St.	100	Nim.	E	2	E	8	E	3	30	19	------	------	------	----
100	St.	90	St.	30	St.	N	4	N	8	----	0	29	18	------	------	------	----
100	St.	100	St.	100	St.	S W	8	S W	24	W	12	32	22	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	------	----
76	--------	81	--------	61	--------	----	----	----	----	----	----	------	------	------	------	1.83	4
75																	

METEOROLOGICAL OBSERVATIONS FOR

Day of Month.	Thermometer, In Open Air.				Relative Humidity, or Per Cent of Saturation.			Pressure of Vapor, In Inches.			Barometer, Reduced to Freezing Point.			
	7 A. M.	2 P. M.	9 P. M.	Daily Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	30	38	33	33⅔	89	54	89	.149	.123	.168	29.059	29.053	28.983	29.032
2	25	25	20	23⅓	100	87	100	.135	.117	.108	29.018	29.186	29.334	29.179
3	19	27	23	23	85	88	86	.087	.129	.107	29.380	29.317	29.312	29.336
4	30	36	26	30⅔	78	61	100	.130	.129	.129	28.712	28.580	28.796	28.696
5	18	33	29	26⅔	100	79	78	.098	.151	.124	29.023	28.948	28.953	28.975
6	23	26	10	19⅔	86	88	100	.107	.123	.068	29.205	29.148	29.103	29.152
7	4	10	1	5	100	100	100	.052	.068	.045	29.228	29.394	29.445	29.356
8	2	9	4	5	100	100	100	.047	.065	.052	29.417	29.379	29.378	29.391
9	15	18	22	18⅓	82	100	100	.071	.098	.118	29.228	29.119	29.089	29.145
10	29	30	24	27⅔	100	100	100	.160	.167	.129	29.009	28.943	28.942	28.965
11	25	26	17	22⅔	100	88	83	.135	.123	.078	29.061	29.103	29.227	29.130
12	24	33	29	28⅔	100	89	100	.129	.168	.160	29.161	29.113	29.036	29.104
13	28	20	21	23	100	100	100	.153	.108	.113	28.711	28.786	28.968	28.822
14	22	25	18	21⅔	100	87	100	.118	.117	.098	28.959	29.008	29.051	29.006
15	22	19	14	18⅓	100	85	82	.118	.087	.067	29.018	29.053	29.038	29.036
16	18	23	18	26⅓	84	73	84	.083	.090	.083	29.043	29.005	29.008	29.019
17	8	14	12	11⅓	78	100	100	.048	.082	.075	28.972	28.948	29.146	29.022
18	2	18	9	8⅓	100	100	100	.039	.098	.065	29.318	29.349	29.362	29.343
19	17	31	32	26⅔	100	89	100	.094	.155	.181	29.336	29.192	29.086	29.205
20	28	32	34	31⅓	100	100	100	.153	.181	.196	29.018	28.835	28.771	28.875
21	38	38	38	38	100	82	81	.229	.203	.186	28.774	28.813	28.845	28.811
22	35	35	32	34	90	80	100	.183	.178	.181	28.913	28.798	28.913	28.875
23	29	31	27	29	100	89	100	.160	.155	.147	28.886	28.893	28.958	28.912
24	32	36	32	33⅓	89	71	100	.162	.149	.181	29.104	29.154	29.248	29.169
25	28	37	30	31⅔	100	63	100	.153	.136	.167	29.327	29.279	29.291	29.299
26	30	34	32	32	100	90	100	.167	.175	.181	29.237	29.324	29.357	29.306
27	31	36	30	32⅓	100	90	100	.174	.191	.167	29.380	29.361	29.376	29.372
28	29	36	29	31⅓	100	71	100	.160	.162	.160	29.375	29.352	29.316	29.358
29	24	30	20	24⅔	100	89	100	.129	.149	.108	29.352	29.376	29.362	29.363
30	28	29	25	27⅓	100	100	100	.153	.160	.135	29.287	29.284	29.291	29.287
31	25	23	18	23⅔	87	88	100	.117	.136	.098	29.277	29.276	29.359	29.304
Sums	------	------	------	------	------	------	------	------	------	------	--------	--------	--------	--------
Means	------	------	------	24°.80	95	86	96	.125	.135	.125	--------	--------	--------	29.124
Average ------------------						92			.128		----------------------------------			

THE MONTH OF DECEMBER, 1882.

CLOUDS.						WINDS.						REGISTERING THERMOM'R.		RAIN AND SNOW.			
7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.							
Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Per Cent of Cloud.	Kind.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow.
100	St.	100	St.	100	St.	S W	8	----	0	S W	1	38	25	------	------	------	----
100	St.	100	Cu. St.	10	Cir.	N	12	N E	12	----	0	28	14	------	------	------	----
90	St.	100	St.	100	St.	----	0	S W	3	S W	12	30	18	In	night	.08	1
100	St.	100	St.	100	St.	S	16	S W	24	S W	16	37	17	------	------	------	----
40	St.	100	St.	100	St.	----	0	----	0	W	8	33	18	------	------	------	----
100	St.	80	Cu. St.	100	Nim.	W	8	W	12	N W	4	26	1	------	------	------	----
10	Cir.	90	Cir. St.	00	--------	W	16	NW	12	----	0	10	-4	------	------	------	----
80	Cir. St.	100	Cu. St.	100	Cu. St.	S W	4	S W	4	S W	3	9	2	------	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	S E	2	S	1	----	0	20	15	6 P. M.	------	------	----
100	Nim.	100	Nim.	100	Nim.	----	0	S W	8	S W	4	30	20	------	------	------	----
100	Nim.	90	Cu. St.	100	Cu. St.	S W	1	S W	4	S W	8	29	12	------	12 M.	------	4½
100	Cu. St.	100	Cu. St.	100	Nim.	S W	22	S	14	S E	9	39	21	8 P. M.	------	------	----
100	Nim.	100	Nim.	100	Cu. St.	W	22	NW	26	----	0	33	16	------	------	------	----
100	Nim.	100	Nim.	60	Cir.	S W	6	NW	16	S W	16	23	15	------	3 P. M.	.80	3
100	Cu. St.	100	Cu. St.	15	Hazy, in s. w. Cir. & Cu. St	S W	20	W	19	N W	12	17	11	------	------	------	----
100	Nim.	100	Nim.	100	Nim.	W	14	W	21	W	8	23	4	------	------	------	----
100	Nim. & St.	30	Cir. Cu.	100	Cu. St.	S	3	S E	6	E	3	24	-10	------	------	------	----
10	Cir.	30	Cir. St.	00	--------	----	0	S W	8	----	0	19	-4	------	------	------	----
20	Cir. St.	100	Cu. St.	100	Cu. St.	----	0	S E	8	S E	8	33	15	------	------	------	----
100	Cu. St.	100	Nim.	100	Nim.	E	4	E	8	E	16	38	26	10 A. M.	------	------	----
100	Cu. St.	100	Cu. St.	100	Nim.	S	12	S	8	S W	8	40	34	------	------	------	----
100	St.	100	Cu. St.	100	Cu. St.	S W	8	W	8	S W	6	40	29	------	------	------	----
100	Cu. St.	100	Cu. St.	100	St.	S W	8	S W	12	S W	5	32	27	------	------	------	----
100	Cu. St.	100	St.	100	Cu. St.	W	12	W	12	----	0	36	28	------	------	------	----
100	St.	100	St.	100	St.	----	0	----	0	----	0	37	28	------	------	------	----
100	St.	100	Cu. St.	100	St.	E	1	E	2	----	0	37	28	------	------	------	----
100	St.	100	St.	100	St.	----	0	----	0	----	0	37	29	------	------	------	----
100	St.	100	St.	100	St.	----	0	----	0	----	0	36	22	------	------	------	----
20	St.	10	Cir. Cu.	00	--------	S W	8	S W	12	----	0	30	18	------	------	------	----
100	St.	100	St.	100	St.	W	6	W	6	W	12	31	24	------	------	------	----
100	Nim.	100	St.	00	--------	S W	8	N W	8	----	0	29	8	Snow	sq'lls.	------	½
----	--------	----	--------	----	--------	----	----	----	----	----	----	------	------	------	------	.88	9
86	--------	91	--------	80	--------	----	----	----	----	----	----	------	------	------	------	------	----
		86															

ABSTRACT OF METEOROLOGICAL TABLES FOR 1882.

MONTHS.	Barometer Corrected for Temperature of 32° F.	Mean Temperature in Open Air.	Relative Humidity.	Pressure of Vapor in Inches of Mercury.	Percentage of Cloudiness.	Rain and Melted Snow in Inches.	Snow in Inches.
January	29.144	24°.89	89	.128	72	1.47	6.50
February	29.053	35°.12	75	.156	56	2.28	5.00
March	29.110	35°.96	77	.164	68	3.58	6.00
April	29.101	44°.70	67	.202	57	1.88	----------
May	29.077	52°.73	66	.269	53	4.04	----------
June	28.971	66°.49	72	.472	53	5.57	----------
July	29.108	67°.71	72	.485	43	2.32	----------
August	29.074	69°.52	83	.602	54	5.72	----------
September	29.198	59°.98	83	.429	43	.67	----------
October	29.124	52°.67	81	.329	50	2.64	----------
November	29.187	36°.30	85	.195	75	1.83	4.00
December	29.124	24.°80	92	.118	86	.88	9.00
Mean for the year	29.106	47°.57	78	.296	59	----------	----------
Sums	----------	----------	----------	----------	----------	32.83	30.50

Thunder storms for the year, 25.

INDEX.

INDEX.

A.

PAGE.

Abbot, President, Lecture by, 358
Accounts, College 7
Accounts of Secretary, 7–21
  Farm Department, 9
  Horticultural Department, 10
  Library, 11
  Chemical Department, 11
  Department of Zoölogy, 11
  Apiary, 11
  Mechanical Department 12
  Boarding Hall, 12
Andrews, Hiram, Essay by, 303
Angell, Elliot H., Essay by, 316
A Farmer's Life 323
Agriculture, The Millennium of, 345
Armada Institute, 213
Agricultural College, Early History of, 358

B.

Bauer, Charles, Essay by, 323
Baird, Secretary R. G., Lecture 387
Berlin Institute, 200
Best Breed of Hogs for this Locality, 286
Bray, J. C., Essay by, 283
Breeding Stock, 271
Boys, How Shall Farmers Educate Them? 333
Butterfield, Jr., J. H., Essay by, 271
Buell, B. G., Essay by, 287
Butterfield, Ira H., Essay by, 345
Boys, How Shall They Be Kept on the Farm? 406

C.

Cassopolis Institute, 199
Cattle, Holstein, 290
Cannon, S. B., Essay by, 300
Cereal Crops, Preparation for, 222
College Accounts, 7
  Lands, 19
Corn Culture, 228
Cook, A. J., Lecture by, 246
Clover, and How to Handle it, 248
Clover as a Fertilizer, 251
Corn Raising, 252

D.

PAGE.

Dairy, Management of, 281
Davenport, Eugene, Essay by, 222
  Discussion of, 226
Department Accounts, 9–12
  Farm, 9
  Horticultural, 10
  Library, 11
  Chemical, 11
  Zoölogy, 11
  Apiary, 11
  Mechanical, 12
  Boarding Hall, 12
Department Reports, 22–179
Domestic Animals, Medical Treatment of, 264
Drainage, 296
Draining Under, 298
Drainage, Farm, 300
Drainage, " 303
Duty of the Farmer to Insure Against Fire, 316

E.

Education, 329
Ensilage Experiments, 417
Estimates of Receipts and Expenditures for Agricultural College for years 1883–4, 13–18
Experiments with Insecticides, 246
Experiments with Ensilage, 417

F.

Farmers' Institutes, 298
Farmington Institute, 215
Farm Drainage, 300
Farm Drainage, 303
Farm Implements and Their Care, 310
Feeding Stock, 283
Flanders, E. P., Essay by, 252
Fine Wool Husbandry, 292
Fairs, And How to Conduct Them, 314
Fire, Farmers Duty to Insure Against, 316
Farming, Mixed, 318
Farmer's Life, 323
Farming as an Occupation, 386

G.

Galesburg Institute, 219
Gardner, D. M., Essay by, 314
Government of Students, 195
Granger, Mrs. Albert, Essay by, 281
Greenville Institute, 204

H.

Hastings Institute, 212
Hunter, John M., Essay by, 228
Hogs, Best Bred for this Locality, 286
Hogs, and how to Handle Them, 287
Holstein Cattle, 290
Hinkson, George, Essay by, 318
Husbandry, Mixed, 321
Howell, Geo., Essay by, 326
How Shall Farmers Educate Their Boys? 333
Hamilton, Wm. B., Essay by, 333

PAGE.

Home, The Farmer's 341
Home Life, ... 393
How Shall the Boys be Kept on the Farm? 406

I.

Institutes of 1882, ... 198
  Leslie, ... 199
  Berlin, ... 200
  Greenville, ... 204
  Lapeer, ... 209
  Macon, ... 210
  Cassopolis, ... 199
Institutes of 1883, ... 211
  Hastings, ... 212
  Armada, ... 213
  Farmington, ... 215
  Jeddo, ... 216
  Trent, ... 217
  Galesburg, ... 219
Insecticides, Experiments with, ... 246

J.

Jeddo Institute, ... 216

K.

Kedzie, R. C., Lecture by, ... 233
Kedzie, F. S., Essay by, ... 239
Kedzie, R. C . Lecture by, ... 279

L.

Laws Relative to Agricultural College, ... 180
  Regarding Reports, ... 187
  Of Congress, ... 189
  Military Department, ... 189
Lapeer Institute, ... 209
Leslie " 199
Line Breeding and Value of Pedigrees, ... 261
Literary Discipline, Farmers Need of, ... 326
Lectures and Essays at Farmer's Institutes, ... 222–416

M.

Marhoff, H., Essay by, ... 310
Mac Ewan, E. J., Essay by, ... 406
Management of the Dairy, ... 281
Macon Institute, ... 210
Medical Treatment of Domestic Animals. 264
Merrick, Wm. H., Essay by, ... 226
  Discussion of, ... 228
Military Department, ... 189
  " Officers, ... 192
Miller, G. W., Essay by, ... 230
Merrick, Jas., Essay by, ... 290
Mechanic, the Farmer his Own, ... 306
Machinery, and its care, ... 310
Mixed Farming, ... 318
Mixed Husbandry, ... 321–2
Mac Ewan, E. J., Essay by, ... 393
Meterological Observations, 1881, ... 619–644
  " " 1882, ... 645–6–770

N.

PAGE.

Nitrogen, Source of in Plants, 379

O.

Osborn, George W., Essay by, 248

P.

Pedigree, and Value of Line Breeding, 261
Potato Culture, 230
President's Report, 22
Preparation of Soil for Cereal Crops, 223
  Discussion of, 226
Preston, John, Essay by, 298
Proper Methods of Conducting Fairs, 314

R.

Report of President, 22
  Prof. of Agriculture, 53
  “ “ Chemistry, 86
  “ “ Zoölogy, 92
  “ “ Botany and Horticulture, 98
  “ “ Mathematics and Civil Engineering, 153
  “ “ English Literature, 160
  “ “ History and Political Economy, 177
  Supt. Horticultural Department, 84
Rotation of Crops, 226
  Discussion of, 228
Ripening of Wheat, 233
Raising Corn, 252
Rich, Hon. John T., Essay by, 296
Report of Cattle Commissioners, 425
Report of State Agricultural Society for 1881, 427–514
Report of State Agricultural Society for 1882, 515–544
Reports from County Societies, 600–617

S.

Secretary's Account, 7–21
Selection and Disposition of Land, 193
State Acceptance of United States Grant, 192
Students' Government, 195
Summary of Inventory, 12
Supplementary Statement of Secretary, 18
Sorghum Sugar, 239
Stock, Value of Pure-bred, 257
Stockholm, A. J., Essay by, 264
Stock breeding, 271
Stock feeding, 283
Stickney, Judge W. W., Essay by, 292
  Discussion of, 295
Snyder, F. C., Essay by, 341
Straw; what shall we do with it? 343
Sheldon, Geo. L., Essay by, 343
Silos, 428
Student's Government, 195

T.

Taylor, R. L., Essay by, 329
Taylor, J. E., Essay by, 257
The Farmer His Own Mechanic 306
The Farmer's Need of Literary Discipline, 326

PAGE.
The Farmer's Home, ... 341
The Millennium of Agriculture. 344
Towne, C. A., Essay by, ... 321
Trent Institute, ... 217
True, E. D. A., Essay by, ... 306
The Earlier History of Michigan Agricultural College up to its Re-organition in 1861, ... 358
The Source of Nitrogen of Plants, ... 379

U.

Under Draining, ... 298

V.

Value of Pure-bred Stock, ... 257

W.

What Shall we do with Our Straw? 343
Whitney, A., Essay by, ... 286
Wheat, Ripening of, ... 233
  Time of Cutting, ... 235
  Chemical Analysis of, ... 237
Wood, A. F., Essay by, ... 261
Wool Raising, ... 292

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